tain extent with other simple meteorological factors such as temperature, wind velocity, humidity and rainfall. The present is a record of the observations kept for four years, 1940-43.

The following table contains the averages of some meteorological factors and the number of dusty days for the period 1940-43:—

Month	Rainfall in inches	Humidity%	Temp. °F.	Wind Velocity in miles per hour	No. of Dusty Days
January	1·0	78	49	5·9	..
February	0·9	65	55	7·2	..
March	0·1	43	68	8·5	4
April	0·3	30	80	8·7	9
May	0·3	29	89	10·2	19
June	1·7	49	89	9·4	12
July	6·2	73	87	10·2	5
August	8·2	83	83	9·5	..
September	3·1	73	80	7·7	..
October	..	57	74	5·8	..
November	..	47	62	4·5	..
December	0·3	67	51	5·4	..

It appears that it is in the month of May the driest of the year, that the largest number of dust storms occur. This has also been found in Oklahama by Langham and others.[10] Kelogg[11] recorded similar observations.

It can be concluded that the number of dusty days in any summer month varies directly as the wind speed and the temperature and inversely as the humidity and rainfall.

From various considerations this is not altogether unexpected. Thus occurrence of dust in the air is intimately connected with meteorological conditions. Driest and warmest years are expected to have dustiest summers and this is probably true for all localities situated in arid and semi-arid regions.

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A RELATION BETWEEN THE SHEAR CONSTANT c_{44}, MELTING POINT AND INTERATOMIC DISTANCE OF METALS

IT is usual, in the study of the solid state of matter, to correlate the various physical properties of solids to their lattice constants and obtain the latter independently from them. A similar study reveals that the shear constant c_{44} of all metals crystallising in the cubic system is intimately related to their melting-points and the interatomic distances. It is found that the following relation holds good:

$$\frac{(c_{44})_0 r^3}{T_m} = 9 \cdot 0 \times 10^{-15}$$

$(c_{44})_0$ is the shear constant of single crystals at the absolute zero, r is the interatomic distance and T is the melting-point in degrees Kelvin. The interatomic distance calculated from the above formula on substituting the known values of c_{44} and T_m are given in the table. With the exception of αFe, c_{44} for all the metals have been taken from our earlier paper[1] where their values at the absolute zero were estimated. The room temperature values have been used for W,. Pb and αFe. On account of the small coefficient of expansion of tungsten, we do not expect a large difference between the room temprature and the absolute zero values of c_{44} in that case, but in the other two cases the difference may be of the order of 10 per cent. The errors of measurement of c_{44} are, however, generally larger. It will be seen that the difference between the calculated and experimental values of r is never more than 5 per cent., which is of the order expected from the uncertainty of about 15 per cent. in the values of $(c_{44})_0$.

It is interesting that a change from the face-centered to the body-centered structures does not effect the validity of the formula.

Structure	Metal	$r \times 10^8$ calculated	$r \times 10^8$ experimental
Face-centered ..	Al	2·96	2·86
	Ag	2·82	2·86
	Au	2·89	2·87
	Cu	2·46	2·55
	Pb	3·35	3·49
Body-centered ..	W	2·78	2·73
	αFe	2·41	2·47
	Li	3·14	3·04
	Na	3·78	3·72
	K	8·87	4·62

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A NEW HYPOTHESIS FOR THE MECHANISM OF ACTIVATION OF SUBSTRATE MOLECULES BY ENZYMES

ACTIVATION of molecules in chemical processes is very generally accepted to be due to collision between reactant molecules with sufficient violence, resulting in transformation of kinetic energy of translation into vibrational energy