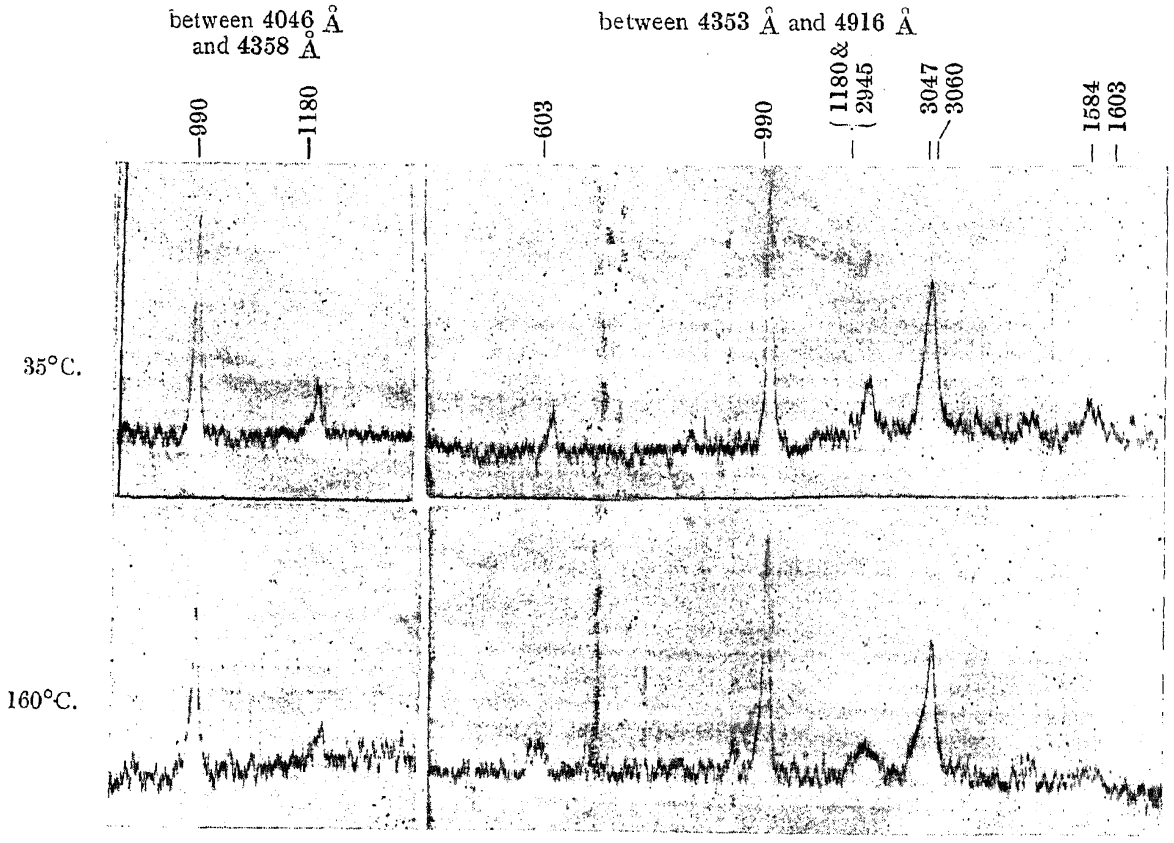

Fig. 1.

intensity of the corresponding Raman lines is due to anisotropic scattering depending on the orientation of the molecule. Such a Raman band possesses a structure consisting of ten branches. The frequency shifts of these branches from the centre of the band depends on J and K, where J and K are the quantum numbers of the total rotation impulse and that along the axis of the molecule respectively. The probability of higher values of J and K increases with the rise of temperature and consequently the width of the band also increases.

It is easy to understand why the width of the lines 990 cm.$^{-1}$ and 3060 cm.$^{-1}$ does not increase with the rise of temperature. These lines being due to total symmetric oscillations the intensities of the central lines are due to "spur" scattering, *i.e.*, scattering contributed by the diagonal sum of the matrix elements of the tensor representing the change of polarisability. Such a scattering is independent of the rotation of the molecules. There is, however, an accompanying rotational wing, but it is as feeble in comparison with the central sharp line as the wing accompanying the Rayleigh line is in comparison with Rayleigh line itself.

The author's thanks are due to Prof. D. M. Bose for his kind interest in the work.

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Lilac Ortho-Pyroxenes from Koratagere (Mysore State).

AMONG the outcrops which form the suite of Cordierite-hypersthene rocks near Bidaloti (Lat. 13° 31′ N.; Long. 77° 17′ 30″ E.) in Koratagere taluk, are a few which show a peculiar violet or lilac ortho-pyroxene. This is the first instance in which such a type of ortho-pyroxene has been noticed in Mysore and so far as we are aware, its occurrence has not been recorded elsewhere either. In microsections the mineral shows the usual characteristics of hypersthene, *i.e.*, straight extinction, negative sign and pleochroism but differs from it in having a lower refractive index, a lesser intensity of pleochroism and a different scheme of axial colours as noted below:

X = yellow.
Z = Y = lilac to lavender.

The mineral is closely associated with the normal pink to green pleochroic hypersthene, cordierite and biotite, and it is probably a derived species from the reconstruction of the altered products of the latter two minerals. Detailed investigations regarding its optical and chemical characters, etc., are being carried on and the results obtained will be published elsewhere in due course.

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The Open Pan System of White Sugar Manufacture.

IN the note published in the July issue (p. 24) of *Current Science* Dr. Iyengar was somewhat unkind to the growing industry, having perhaps overlooked the extreme limitations of the modern factory system. In view of our unique agricultural and market conditions, the ultimate scope of the vacuum plants may be estimated at 15 per cent. of the total sugar produce of the country; whereas the open pan system, the output of which already equals that of the large centrals, has a fair chance of superseding the primitive methods of *gur* manufacture, if further technical development is fortheoming.

Dr. Iyengar's figures relating to low sucrose recovery by the open pan process curiously fail to discourage the average *Khandsari* which, with simple equipment, turns out 5 per cent. white sugar and 6 per cent. *gur* of marketable quality as against Indian factory averages of 5 per cent. first sugar, 4 per cent. inferior grades and 4-5 per cent. waste as molasses. Nor does the comparatively inefficient milling, which yields about 15 per cent. less juice than the elaborate tandem of the factory, constitute an entire disadvantage as the absence of the additional impurities that would result from multiple crushing serves to render the by-product edible.

Open pan boiling *per se* is not an unsound proposition, if it is recognised that one of the most expensive complications of the modern central, *viz.*, vacuum evaporation, although desirable on economic grounds when dealing with several hundreds of tons of juices daily, can be dispensed with by the small manufacturer with little appreciable damage to the juices. In fact, up-to-date factories in Europe evaporate beet juices under *pressure*, the issuing vapours serving as process steam for auxiliary purposes.

The possibilities of the open pan process cannot be gainsaid, as further investigations might lead to the evolution of a cheap manufacturing unit yielding with minimum waste, a product that might satisfy non-fastidious consumers and serving the interests, needs and limitations of the agricultural classes as no expansion of the modern factory system can.

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I AM not in the least unkind to the open pan industry but am simply looking at hard facts in the face. Since the days of "Hadi Process" the open pan system is surely making sugar during a period of over 20 years, but still the factory system has made enormous strides during the last three years.

The one point at issue is that the open pan system of making white sugar cannot compete with the factory system, and is bound to disappear in course of time just as it has already done in other countries. Similarly even the small inefficient sugar factories are bound to make room for large efficient ones.

The open pan system has certainly a place in the production of *gur* from pure cane juice and not from a mixture of juice and molasses or from molasses. Any improvements in that direction are certainly welcome in the interests of the small cultivator who produces *gur* for eating and not refining purposes.

During the period that the sugar tariff lasts, I think serious efforts should be made to put the sugar industry on a sound basis so as to be able to compete with foreign sugar in the Indian market even if the tariff is removed. Efforts to improve the open pan system are not likely to achieve much more than what has been done during the last 20 years, and may even give a set back to the sugar industry in the long run.

If facts and figures are brought forth to prove that the *Khandsari* can make more money by making sugar than by making *gur* of good quality, then I am prepared