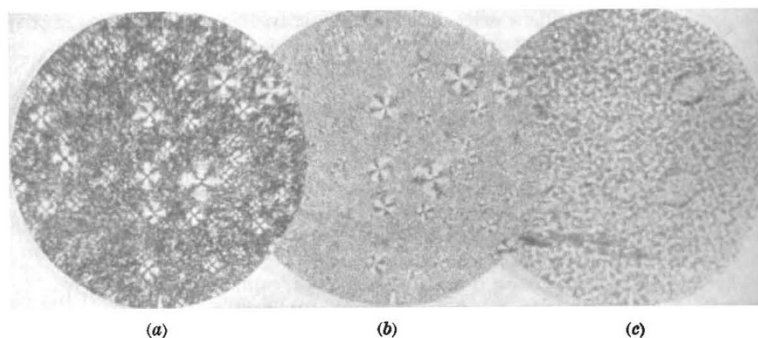


reliable, and indeed may be quite anomalous, as for silver hydride. Also it is likely that for the excited states of carbon monoxide there may be potential maxima, and the limit of the extrapolation will then be the maximum instead of the dissociation limit. In the reaction zones of flames much of the light emission is due to chemiluminescence, and it is not easy to account for this unless we are able to postulate reactions which are highly exothermic and which require the high value for $D(\text{CO})$. The 9.61 value would, however, give a more satisfactory comparison with the iso-electronic molecule N_2 , for which I favour a dissociation energy of 9.76 eV.

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¹ Gaydon, A. G., "Spectroscopy and Combustion Theory", 190 (2nd edit., 1948).



Liquid crystals in milled petroleum jelly ($\times 50$). (a) Nicols crossed, black field; (b) nicols in phase, white field; (c) unpolarized light

It is interesting to note that prolonged treatment in the Werner-Pfleiderer mixer results in the formation of liquid crystals.

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¹ [Nature, 163, 248 (1949).]

² "The Measurement of Plasticity", in "The Science of Petroleum", 1115 (Oxford University Press).

Thixotropic Behaviour of Petroleum Jelly

IN my earlier communication¹ I directed attention to the reversible change of consistency brought about by the slow and fast shear of petroleum jelly. The present note embodies more precise observations, but it is evident that further work still is needed to interpret the mechanism of the phenomena.

When threshold rigidities are measured in a modified form of parallel-plate plastimeter, reproducible values are not obtainable on the bulk material which has been melted and allowed to cool, owing to heterogeneity of crystalline disposition throughout the mass. However, treatment for a few hours in a slow-running Werner-Pfleiderer mixer reduces rigidity to the minimum value characteristic of slow churning. A parallelism between the results obtained by churning and by treatments under more accurately specified conditions is shown in the following table:

Rigidities by parallel-plate plastimeter	
1. After 2 hours in Werner-Pfleiderer mill	15 dynes/cm. ²
2. Followed by two successive shears through a glass capillary at 35,000 dynes/cm. ² stress	57 "
3. Treatment (2) followed by capillary shear at 1,350 dynes/cm. ² stress	38 "
4. Treatment (2) followed by capillary shear at 2,700 dynes/cm. ² stress	41 "
5. Treatment (2) followed by capillary shear at 5,200 dynes/cm. ² stress	48 "

It is evident from the fact that treatment (3) has not resulted in reducing the rigidity to its original value that the number of operations was inadequate and/or the shear stress was too high to effect a complete reduction of rigidity to the value shown by (1). In all cases shear was kept well below the limit of incidence of turbulent flow.

I have already referred² to a thixotropic anomaly in the capillary shear of petroleum jelly, but uncertainty as to the significance of 'yield value' obtained as an intercept of the stress-shear line to the stress axis does not justify its discussion in the present communication.

Auroral Displays at Saskatoon

A VERY intense auroral display was observed at Saskatoon during the night of January 24-25. The display began as a red aurora at 6.15 and the red colour persisted until 7.45; all times mentioned are Mountain Standard Time (seven hours behind G.M.T.). Some red was present at all times up to midnight. At 7.30 the display consisted of two red sheets in the east and west, and a beautiful corona near the zenith. The corona was green overhead, and red near the eastern and western borders. Three homogeneous arcs were present at 8.00, one in the north at altitude 15°, a second passing through the zenith, and a third in the south at altitude 10°. All auroral forms were present at some time during the display, which lasted until dawn. Newspaper reports indicate that the red aurora was seen in British Columbia and as far south as California.

A second intense display occurred during the night of February 21-22. Again all auroral forms appeared during the display, and some red colour was observed at times. During most of the night an arc passing through the zenith extended from horizon to horizon. At times this arc was extremely bright.

A photograph of the sun's surface taken at noon on January 24 showed a large sunspot group about two days past the solar meridian. On February 21 this group was still present although considerably reduced in size.

A new high light-gathering power grating spectrograph was put into operation for the first time on February 21. This instrument gives a dispersion of 20 Å/mm. A four-hour exposure gave a spectrogram which included two weak features at the positions of $H\alpha$ and $H\beta$.

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