been shown elsewhere, most probably coincides with their common dispersal centre. The Chou Kou Tien discovery therefore furnishes one more link in the already strong chain of evidence supporting the hypothesis of the central Asiatic origin of the Hominidæ.

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Action of Magnetic Fields on the Refractive Index of Carbon Dioxide Gas.

A. GLASER (*Ann. d. Physik*, 75.4, pages 459-488, and *Ann. d. Physik*, 78.4, 641-658), in determining the susceptibility of diamagnetic gases, noticed that, under a definite magnetic field, the susceptibility decreases as the pressure of the gas is decreased, approximately proportional to the pressure. For a certain pressure range, however, there is a deviation from the above law, and the law of variation, instead of being linear, follows approximately a parabolic law, and above and below this range the linear law has different characteristics.

Working to detect any relationship between the refractive index and pressure, Fraser (*Phil. Mag.*, April 1926, pp. 885-890), using the Jamin refractometer, failed to notice any change in the refractive index when the gas is subjected to a sudden magnetic field of about 184 gauss within a pressure range of 0·001 to 8 mm.

The present authors have noticed a decided change in the refractive index of pure dry carbon dioxide gas,

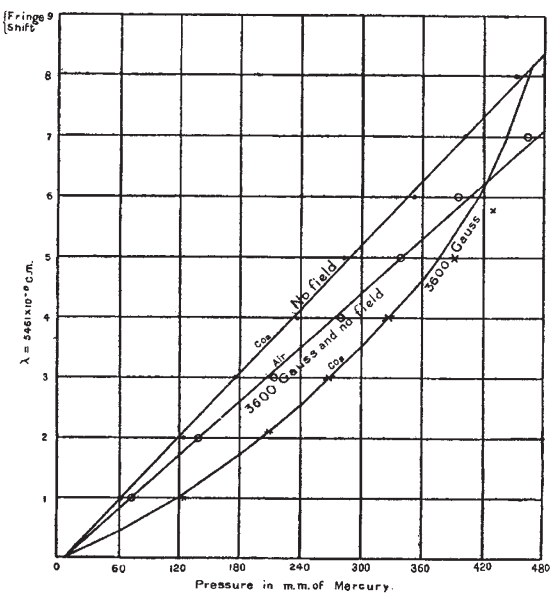

FIG. 1.

when subjected to a constant magnetic field of 3600 gauss, acting transversely to the direction of propagation of light and the pressure gradually increasing from 10 mm. to 400 mm. A Michelson type of interferometer was used for the purpose, and all parts were carefully selected to be non-magnetic. The graph (Fig. 1) shows the relation between the shift of fringes and the pressure variation within the range 10 mm. to 400 mm. for air and carbon dioxide. In the case of air, the magnetic field has no influence whatever on the refractive index, whereas with carbon dioxide the fringe shift nearly follows a parabolic path in the same region of pressure, as has been noted by Glaser. This shows a decided orientation of the molecules under the magnetic field, at least in the case of a dipolar gas of the type of carbon dioxide.

Experiments are in progress to determine the change with different temperatures and other dipolar gases.

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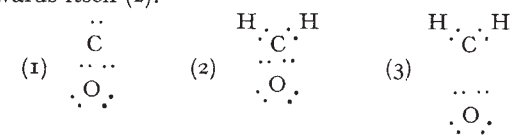
Electron Displacement *versus* Alternate Polarity in Aliphatic Compounds.

ADHERENTS of the theory of induced alternate polarity in carbon compounds consider in their deductions also the general electron displacement effect of Lewis's theory; some partisans of the latter theory, however, question the reality of the alternate effect, especially so far as open-chain compounds are concerned. (Cf. H. F. Lucas and co-workers, *J. Am. Chem. Soc.*, 46, 2475 (1924); 47, 1462 (1925).)

It seems to me that recent results of V. Henri and Sv. A. Schoú [*C. R. Acad. Sci. Paris*, 182, 1612 (1926)] afford strong evidence in favour of the alternate effect. Making use of spectroscopic data, these authors succeeded in determining the distances between the atoms in some simple organic molecule, in the gaseous state. They find for the distance between the carbon and oxygen atoms in carbon monoxide 1·02 Å.U., whereas the same distance in formaldehyde is found to be 0·9 Å.U. It is just such a *decrease* of the distance carbon to oxygen by the presence of the two hydrogen atoms, that would be expected on the basis of the alternate polarity theory.

Indeed, let us suppose for the sake of comparison that in carbon monoxide the four binding electrons are lying at equal distances from the nuclei of the two atoms (1). In formaldehyde, then, according to the alternate effect and considering the positivity of the hydrogen atoms, the carbon atom must become less positive, *i.e.* it attracts the electrons of its octet, and together with them the oxygen nucleus, nearer towards itself (2).



On the contrary, the general Lewis effect would require a displacement of the binding electrons towards the oxygen nucleus, and thus an *increase* of the distance between carbon and oxygen (3).

In phosgene, $COCl_2$, the reverse effects would be expected according to both theories on account of the negative chlorine atoms; the data for distances are, however, not yet available in this case.

If one assumes a triple bond in carbon monoxide (cf. Lewis, "Valence," 1923, p. 127), the above conclusions become doubtful, since it is not known how interatomic distances are influenced by the transition of bonds; only a direct comparison of the distances in formaldehyde and phosgene could afford conclusive evidence then.

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