

If equal times were spent in each state the calculated susceptibility would agree closely with the experimental.

	Calculated	Experimental
Formamide	-22.39	-21.87
Acetamide	-34.29	-33.75

In thioacetamide, however, there is not the same resonance, as the experimental susceptibility indicated a stable doubly bound structure.

These results show that the study of diamagnetic susceptibilities can be applied to problems involving quantum mechanical resonance, and allowing for relatively small experimental errors, seem to indicate a distinct tendency for molecules to spend non-fractional times in the possible states.

The deduction of the theoretical values for sulphur bonds which were not given by Gray and Cruickshank will be published elsewhere.

ARCHD. CLOW.

Department of Chemistry,
University, Aberdeen.
Sept. 28.

J. M. C. THOMPSON.

¹ Pauling and Sherman, *J. Chem. Phys.*, **1**, 606 (1933).
² Gray and Cruickshank, *Trans. Far. Soc.*, **31**, 1491 (1935).
³ Stoner, "Magnetism and Matter" (Methuen, 1934), p. 274.

Constitution of Phosphorous Acid and the Phosphites

MENZIES¹ and Bär² showed that it is possible to obtain Raman spectra with crystal powders in which at least some of the stronger lines of the substances are recorded. I have shown³ that the technique of obtaining the spectra with powders is vastly improved if a pair of complementary filters is used, one having a sharp cut-off on the longer wave-length side between the source and the scattering substance

Illustrations of the power of the new technique are furnished by Fig. 1 in which are reproduced the Raman spectra of crystalline phosphorous acid, ammonium chloride, hydroxylamine hydrochloride, hydrazine hydrochloride, and naphthalene, λ 4046 being the exciting wave-length in all cases. While Bar was able to record only five Raman frequencies in the spectrum of naphthalene crystals, not less than twelve frequencies can be identified in the above photograph. The N—H bands in the solids of the ammonium group have been recorded clearly and distinctly for the first time.

One of the interesting results furnished by the new technique relates to the constitution of phosphorous acid. The Raman spectrum of this acid shows a pair of sharp and intense lines with the frequency shifts 2,486 and 2,509 cm^{-1} . These frequencies presumably arise from a P—H vibration, and show that the

constitution of the acid is $\text{O} = \text{P} \begin{matrix} \text{H} \\ \diagup \\ \text{OH} \\ \diagdown \\ \text{OH} \end{matrix}$. This conclusion is supported by the Raman spectrum of sodium phosphite, Na_2HPO_3 , which shows a strong Raman frequency at 2,335 cm^{-1} .

R. ANANTHAKRISHNAN.

Department of Physics,
Indian Institute of Science,
Bangalore.
Sept. 27.

¹ A. C. Menzies, *NATURE*, **124**, 511 (1929).
² R. Bär, *NATURE*, **124**, 692 (1929).
³ R. Ananthakrishnan, *Current Science*, **5**, 131 (1936).

Water under the Western Ice Cap in North-East Land

At the station maintained from September 1935 to June 1936 near the centre of the Western Ice Cap in North-East Land (80° N., 20° 30' E., approximately) by the Oxford University Arctic Expedition 1935-36, it has been found that, contrary to expectation¹, the ice-cap is not frozen to any great depth. While a shaft was being excavated in the *firm* beneath the station, a *concealed* crevasse was discovered—there was absolutely no trace of it at the surface, even during the period of summer thaw—and investigated to a distance of some hundreds of feet in the horizontal direction. At a depth of some 70 ft. below the surface was a lake of *water* varying in depth from 3 ft. to 6 ft. The bed of the lake was of ice.

- (a)
- (b)
- (c)
- (d)
- (e)

There is reason to believe that this water remains in the liquid state throughout the year, and preliminary calculations give

an estimate of the order of fifty years for the age of the crevasse at water-level.

It is hoped to publish fuller results, with detailed figures, later.

ROBERT MOSS.

Electrical Laboratory,
Oxford.

¹ J. E. Fjeldstad, *Geografiska Annaler*, **15**, 314 (1933).

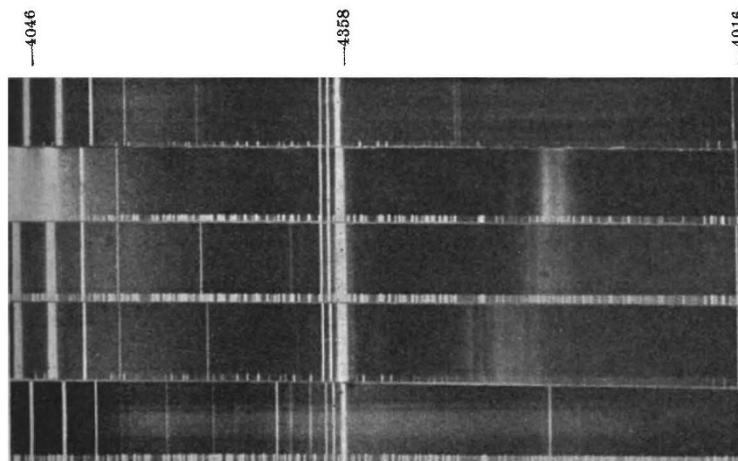


FIG. 1. Raman spectra of (a) crystalline phosphorous acid, (b) ammonium chloride, (c) hydroxylamine hydrochloride, (d) hydrazine hydrochloride, and (e) naphthalene.

to isolate a definite exciting line from the exciting source of light, and the other having a sharp cut-off to the shorter wave-length side in the path of the scattered light in order selectively to weaken or absorb the exciting wave-length. Using this device, it is now possible to record the faintest lines and bands in the spectra of crystal powders and even of amorphous solids by giving suitably long exposures.