

important, and the one in which the "World List" fails most conspicuously. An instance may be given. The *Bulletin trimestriel de la Société d'horticulture de Sedan* appears in the "World List" as *Bull. Soc. Hort. Sedan*; the *Bulletin de la Société centrale d'horticulture du département de la Seine-Inférieure*, Rouen, as *Bull. Soc. Hort. Seine-Inf.* In any alphabetical catalogue one would expect to find the entry for the first journal near to and preceding the second. In fact, in the "World List" the two are some 590 entries apart, the effect of the essential words *centrale* and *trimestriel* being to separate them widely and to reverse their positions. Contractions should not ignore essential words that so appreciably affect the alphabetical position of titles. These contractions would more usefully have been *Bull. Soc. cent. d'Hort. Seine-Inf.* and *Bull. trim. Soc. d'Hort. Sedan*. Occasionally a contraction in the "World List" rearranges the form of title, thus the *Journal of the Royal Army Medical Corps* becomes *R.A.M.C. J.*, a baffling form for most foreigners. The language of the original is even departed from on occasion, thus *Věstník Klubu Přírodovědeckého v Prostějově* becomes *Jahrb. naturw. Kl. Prossnitz*.

The very great value of the "World List" is not gainsaid. It would, however, be interesting to know the opinion of others as to the suitability for universal adoption of its system of abbreviations for the titles of periodicals.

R. L. SHEPPARD.

Bureau of Hygiene and Tropical Diseases,
23 Endsleigh Gardens, London, W.C.1,
Aug. 4.

Molecular Spectra in the Extreme Infra-Red.

THE appearance in the spectrum of monochromatic light diffused by fluids, of new lines of modified frequency (*Ind. Jour. Phys.*, vol. 2, pp. 387 and 399; 1928), gives us a powerful, accurate, and convenient method of exploring molecular spectra, especially in the near and extreme infra-red regions. We have only to photograph the spectrum of the

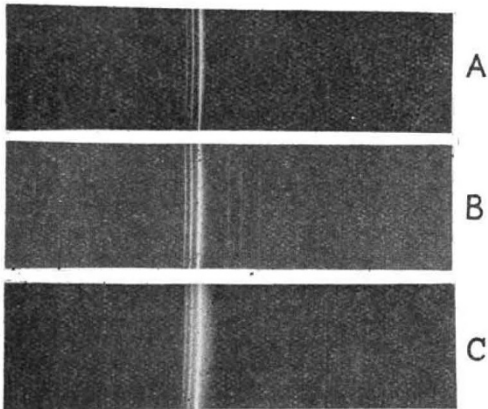


FIG. 1.

scattered light, and the frequency-differences between the incident light and the new radiations excited by it give us the molecular frequencies. As an illustration of what the method is capable of, we may mention the case of carbon tetrachloride, the spectrum of the mercury arc scattered by which is reproduced as Fig. 1 B, 1 A being the incident spectrum. The 4358 Å. line, which is the principal exciter, is accompanied by three sharp lines close to it on the right, from which we deduce 45.4 μ , 31.8 μ , and 21.7 μ as

wave-lengths of three hitherto unknown infra-red lines in the spectrum of the carbon tetrachloride molecule. In addition, we have a doublet 13.0 μ and 12.6 μ , the position of which as an unresolved line was approximately known from the work of Coblenz.

Fig. 1 C shows the nebulosity or continuous spectrum accompanying the 4358 line when it is scattered by benzene. The existence of a continuous radiation accompanying the lines and bands in the scattered spectrum from liquids has been pointed out by us earlier and is indeed visible in our published photographs. Its natural explanation would appear to be that it arises from a combination of the rotational frequencies of the molecule with the frequencies of the incident or scattered radiations, the impedance to the free rotation of the molecules in a dense fluid being the reason why such combination results in a continuous spectrum instead of discrete lines. The unmodified lines being the strongest, the nebulosity accompanying them appears very conspicuous. Incidentally, with reference to a recent interesting paper by Cabannes and Daure (*Comptes rendus*, June 4, 1928), we may direct attention to the distinctly imperfect symmetry of the nebulosity on the two sides of the 4358 line appearing in Fig. 1 C.

C. V. RAMAN.

K. S. KRISHNAN.

210 Bowbazar Street,
Calcutta, July 5.

Infection of *Phlebotomus sergenti* with *Leishmania tropica*.

WORKING in the Government Central Laboratory, Baghdad, as guests of the director, Dr. A. E. Mills, we found that cultures of a strain of *Leishmania tropica* behaved in *P. sergenti* exactly as in *P. papatasi*, that is, in sandflies infected by feeding through a membrane the flagellates tended to an anterior position.

Laboratory-bred *P. sergenti* (17 ♀♀) were fed on an oriental sore in Mosul. Of these eleven became infected and the flagellates were again found to behave as in *P. papatasi*. (Two laboratory-bred *P. papatasi* were fed on the same sore, one becoming infected.)

Two wild females of *P. sergenti* (out of 683 dissected) were found infected with flagellates in the cardia and stomach. Material from one naturally infected sandfly was inoculated into a volunteer (May 28). Up to the present the result is negative.

The above observations, in spite of the negative result of the single experiment on man, which can be explained on various grounds, point to the conclusion that *P. sergenti* is also a carrier of cutaneous Leishmaniasis, a possibility first considered by Sinton (1925). A survey of the distribution of sandflies in Baghdad shows that in some districts *P. sergenti* is the main carrier. Working in Jerusalem with laboratory-bred *P. sergenti* we found that in specimens infected by feeding on man *L. tropica* (long forms of the flagellates only) reaches more than half way down the proboscis after six days at 27° C.

The Kala-Azar Commission of the Royal Society (W. S. Patton and E. Hindle, *Proc. Roy. Soc. B.* vol. 101; 1927) found that out of 430 specimens of *P. sergenti* artificially infected with *L. donovani* only twenty-three showed flagellates in the cardia and none in the oesophagus and pharynx. The tendency of *L. tropica* to an anterior position in *P. sergenti* is therefore in marked contrast to the behaviour of *L. donovani* in the same sandfly.

S. ADLER.

O. THEODOR.

Microbiological Institute,
Hebrew University,
Jerusalem.