ABSTRACTS

DEPARTMENT OF PHYSICS

18. THE SCATTERING OF LIGHT IN FUSED QUARTZ AND ITS RAMAN SPECTRUM. Dr. R. S. Krishnan, *Proc. Ind. Acad. Sci.*, 1953, **36**, 377–84.

A detailed study of the scattering of light in fused quartz and its Raman spectrum has been made. A rectangular specimen of fused quartz of optical A quality has been used. The depolarisation factors ρ_u, ρ_v and ρ_h have been measured. They are respectively 11·5%, 5% and 80%. The intensity of scattering in fused quartz is found to be 1/3·5 of that in pure dust-free ether. The Doppler-shifted components in the light scattered by fused quartz have been recorded using λ 2536 excitation both for the case of transverse scattering and backward scattering. The observed frequency shifts are in general agreement with those calculated from the known elastic constants of fused quartz.

The Raman spectrum of fused quartz has been recorded with λ 2536 excitation. The recorded spectrum exhibits six lines and six bands of varying width and intensity. The frequency shifts are 285, 370, 430, 495, 635, 660, 30 $\sim$ 120, 775 $\sim$ 805, 810 $\sim$ 845, 885 $\sim$ 940, 1022 $\sim$ 1098 and 1140 $\sim$ 1245 cm.$^{-1}$ Besides, there is a weak continuum extending from 30 cm.$^{-1}$ to 500 cm.$^{-1}$ with well-defined edges.

19. PHASE RECIPROCITY RELATION IN LIGHT SCATTERING. N. L. Ramanathan, *Proc. Ind. Acad. Sci.*,1953, **36**, 385–92.

The paper describes the experimental verification of a second reciprocity relation in the scattering of light by colloids, the existence of which was first pointed out by Perrin. This is in addition to the reciprocity relation established by Krishnan (1935). This second relation has essentially to do with the phase changes which occur in the scattering and has the form $a_{34} = -a_{43}$ for a symmetrical medium having no optical activity, where a_{34} and a_{43} are two of the coefficients in the linear representation relating the Stokes parameters (I, M, C, S) of the incident and scattered beams.

20. RAMAN SPECTRA OF CRYSTALLINE SULPHATES OF ZINC, MAGNESIUM AND SODIUM. C. Shantakumari, *Proc. Ind. Acad. Sci.*, 1953, **36**, 393–400.

The Raman spectra of single crystals of the sulphates of zinc, magnesium, magnesium-ammonium and sodium (both thenardite and Glauber's salt)

have been investigated using the λ 2536 resonance radiation of mercury as exciter. The important results obtained may be summarised as follows:

The Raman spectra of thenardite, the anhydrous sodium sulphate and of magnesium-ammonium sulphate have been recorded for the first time. In the case of the sulphates of zinc, magnesium and sodium (Glauber's salt) the recorded spectra indicate the existence of 23, 24 and 20 frequency shifts of which 16, 11 and 17 respectively are newly reported. The low frequency spectrum in each case has the following shifts:

(*a*) *Zinc.*—56, 70, 104, 128, 151, 212, 252 and 373 cm.$^{-1}$;

(*b*) *Magnesium.*—56, 75, 97, 118, 150, 252 and 303 cm.$^{-1}$;

(*c*) *Magnesium-ammonium.*—54, 89, 130, 147, 198, 220 and 265 cm.$^{-1}$;

(*d*) *Thenardite.*—52, 76, 122 and 164 cm.$^{-1}$; and

(*e*) *Glauber's salt.*—53, 134, 158, 231 and 292 cm.$^{-1}$ The Raman lines of the hydrated sulphate are found to be more diffuse than the corresponding lines of the anhydrous sulphate. The results obtained have been discussed in the light of the known structures of these crystals.

21. Raman Spectra of Crystalline Acetates (Sodium, Magnesium and Barium). V. M. Padmanabhan, *Proc. Ind. Acad. Sci.*, 1953, **36**, 401–404.

Using λ 2536 as exciter, the Raman spectra of single crystals of sodium, magnesium and barium acetates have been investigated. The spectra of magnesium and barium acetates and the lattice spectrum of sodium acetate have been reported for the first time. The recorded spectra exhibit as many as 15 lines with sodium acetate, and 23 with magnesium acetate. Tentative assignments have been made for some of the observed lines.

22. Temperature Variation of the Raman Spectrum of Topaz. R. Srinivasan, *Proc. Ind. Acad. Sci.*, 1953, **36**, 405–10.

The temperature variation of the frequency shifts of the intense Raman lines of topaz has been investigated over the range of temperature from 30° C. to 450° C., using the λ 2536 Å U radiation of the mercury arc as the exciter. From the observed variation, values of $\chi \left(= -\frac{1}{\nu}\frac{d\nu}{dT} \right)$ have been calculated for the lines 241, 270, 289, 458, 522, 927, 985 and 3643 cm.$^{-1}$ In the case of the first five lines χ increases with temperature, while for the rest, χ decreases with temperature. Unlike the case of calcite and quartz the

absolute values of χ for the different Raman lines of topaz do not show wide variations.

The temperature variation of the width of the 458 cm.$^{-1}$ line has also been measured. The width of this line is found to increase proportional to the square root of the absolute temperature.

23. RAMAN SPECTRUM OF RUTILE—POLARISATION STUDIES. P. S. Narayanan, *Proc. Ind. Acad. Sci.*, 1953, **36**, 411–14.

A study of the intensity and polarisation of the Raman lines of rutile has been made for different orientations of the crystal. The polarisation data show that the Raman line 610 cm.$^{-1}$ belongs to the degenerate mode E. A calculation of the numerical values of the force constants for rutile taking into account this reassignment reveals that out of the six oxygen atoms which surround any titanium atom, two are bound to it much more strongly than the others.

24. RAMAN SPECTRUM OF CRYSTALLINE AMMONIUM HYDROGEN MALATE. T. S. KRISHNAN, *Proc. Ind. Acad. Sci.*, 1953, **36**, 415–17.

Using the λ 2536 radiation of the mercury arc as exciter, the Raman spectrum of a single crystal of ammonium hydrogen malate has been photographed. The spectrum exhibits 26 Raman lines with frequency shifts 65, 100, 123, 149, 190, 321, 384, 472, 727, 774, 868, 904, 959, 1047, 1111, 1215, 1254, 1325, 1350, 1408, 1464, 1654, 2930, 2970, 3377 and 3500 cm.$^{-1}$

25. LIGHT SCATTERING IN GOLD SOLS. S. R. Sivarajan, *Proc. Ind. Acad. Sci.*, 1953, **36**, 418–23.

The wavelength dependence of the intensity of light scattering by four different gold sols has been investigated experimentally for incident unpolarised light and for incident light polarised with vibrations vertical and horizontal. Photomultiplier tubes have been used for intensity measurements. Suitable corrections have been made for absorption, etc. The intensity of scattering for a gold sol containing very small prolate spheroidal particles of axial ratio B/A = ·75 has been calculated from Gans' theory and compared with the experimental observations. The relation between the intensity of scattering for the different wavelengths and the corresponding absorption has been pointed out.

26. THEORY OF IMAGE FORMATION IN COMBINATIONS OF X-RAY FOCUSSING MIRRORS. Y. T. Thathachari, *Proc. Ind. Acad. Sci.*, 1953, **37**, 41–62.

It is shown that ideally Bragg reflections can occur successively from two surfaces only if they form parts of the same sphere, a result shown to be

sufficient (but not necessary) in an earlier publication. However, if the aperture radius and the size of the object are small compared to the radius of curvature of the reflecting surfaces (such that fourth and higher power of their ratios are less than 10^{-6}), then the combination will work even with aspherical surfaces, provided the two reflectors are surfaces of revolution about a common axis and they are both concave reflectors having the same vertex radius of curvature and are separated by a distance equal to twice this radius. If a combination of two such mirrors are used, and N multiple reflections obtained with them, then the optical path is reduced appreciably (approximately as I/N) and the spherical aberration is also decreased (being proportional to I/N) for large magnifications. The resolving power of such a combination should be of the order of 50 Å. A combination of X-ray mirrors in the form of an X-ray microscope has, therefore, distinct advantages and it appears that the problem of realising such a unit in practice is worth investigating.

DEPARTMENT OF BIOCHEMISTRY

Food and Nutrition

1. STUDIES ON THE NUTRITIVE VALUE OF VEGETABLE MILK (HUMAN METABOLISM TRIALS). D. K. Nandi, R. Rajagopalan and S. S. De, *Science and Culture*, 1952, **18**, 199.

It has been shown that the protein of the vegetable milk is nearly as well available as the protein of cow milk. The subjects on whom the metabolism trials were carried out showed a positive nitrogen balance. Availabilities of calcium and phosphorus contained in vegetable milk are also as good as these elements present in cow milk. The studies have indicated the immense benefit that could be derived by the use of the vegetable milk which is far cheaper to cow's milk.

2. AMINO ACID MAKE-UP OF VEGETABLE MILK. D. K. Nandi and R. Rajagopalan, *Curr. Sci.*, 1952, **21**, 250.

The amino acid composition of vegetable milk has been studied by the Circular Paper Chromatographic technique. Cow's milk was also taken for comparison. It was found that the different bands obtained on the chromatogram with cow's milk were also present with the vegetable milk. This shows that the amino acid composition of both the samples of milk is the same. The colour intensities of the bands were also equal, indicating thereby that not much of a quantitative difference exists between the two types of milk.

3. INFLUENCE OF CALCIUM ON THE SUPPLEMENTARY VALUES OF OIL-CAKES TO THE POOR SOUTH INDIAN DIET. B. M. Lal, R. Rajagopalan and S. S. De, *Science and Culture*, 1952, **18**, 193.

The observation that supplementation of calcium to poor South Indian diet increases markedly the growth of rats has been confirmed. But extra calcium in the diet does not favour an increased utilisation of oil-cakes. Rats fed on mixed protein diet consisting of groundnut, cottonseed and soyabean have shown a remarkable increase in growth. This has been attributed to the mutual supplementation of these different proteins as also to the high content of some of the members of B-complex vitamins.

4. SPRAY DRYING OF INDIAN GOOSEBERRY JUICE. P. B. Rama Rao, S. Balakrishnan and R. Rajagopalan, *Curr. Sci.*, 1952, **21**, 277.

A simple method of obtaining ascorbic acid fortified salt has been devised. Indian gooseberry has a high content of vitamin C, but the juice could not be dried as it is, owing to its sticky nature. After diluting the juice

suitably and adding common salt to make a total of 20% solids, the solution was spray dried using Bown Laboratory Spray Dryer. Salt containing 8·6 mg. of vitamin C per gram was obtained.

5. INFLUENCE OF FREEZING ON THE VOLUME OF JUICE EXTRACTED AND ASCORBIC ACID CONTENT OF CERTAIN FRUITS. P. B. Rama Rao, S. Balakrishnan and R. Rajagopalan, *Curr. Sci.*, 1952, **21**, 337.

Studies were carried out by extracting the juice from Amla, kept at — 20° F. for 48 hours as also those at room temperature for the same period, in a hydraulic press employing the same pressure in both the cases. Quick frozen material yielded 12% more juice than that kept at room temperature. Ascorbic acid recovered was also 5·86% more in the case of the frozen Amla. The same trend of results was obtained in the cases of oranges, cashew apples, lemons and mangoes. The practical significance of this study has been pointed out.

6. STUDIES ON THE INFLUENCE OF FEEDING MILK AND CURDS ON THE INTESTINAL SYNTHESIS OF VITAMIN B_1 IN RATS. S. Balakrishnan and R. Rajagopalan, *Indian Journal of Physiology and Allied Sciences*, 1952, **6**, 143.

A study was conducted to elucidate the influence of feeding milk and curds on the type of intestinal flora and the intestinal synthesis of vitamin B_1 in rats.

The urinary and fæcal excretions of vitamin B_1 of rats receiving curd were significantly greater than the excretions of milk-fed rats.

Bacteriological examination of the fæces of the different groups of animals showed that the number of coliform organisms in the fæces of curd group animals were much higher than in the other groups. Lactobacilli occurred to a greater extent in the fæces of milk-fed rats than in the other groups.

In the light of the above observations, it has been concluded that curd provides a more favourable condition for bacterial synthesis of thiamine than milk, by virtue of its favourable influence on coliform organisms.

7. STUDIES ON VEGETABLE MILK—PART I. D. K. NANDI, R. Rajagopalan and S. S. De, *Ind. Jour. Physiol. and Allied Sci.*, 1951, **1**, 1.

A vegetable milk was prepared by admixture of 56% soyabean, 24% groundnut and 20% ragi malt. Vanslyke and Bosworth salt mixture were employed in order to increase the salt content. The composition of the resultant milk was found to compare favourably with cow's milk regarding

the percentage of total solids, protein carbohydrate and salts. The overall nutritive value of vegetable milk was determined by rat growth experiments and found to be 88% of that of cow's milk.

8. STUDIES ON VEGETABLE MILK—PART II. D. K. Nandi, R. Rajagopalan and S. S. De, *Ind. Jour. Physiol. and Allied Sci.*, 1953, **6**, 6.

Availability of calcium and phosphorus in a sample of milk obtained from a mixture of soyabean, groundnut and ragi malt was studied. Data obtained showed that vegetable milk compared favourably with cow's milk in regard to the availability of these two mineral elements.

9. USE OF OIL-SEEDS AS ARTICLES OF HUMAN FOOD. B. M. Lal, R. Rajagopalan and K. V. Giri, *Oleagineaux*, 1952, **7**, 637.

The possible use of various oil-seeds as such, and products processed from them, as articles of human food have been discussed. Methods of preparation of thiamine enriched groundnuts, full fat soyaflour, and multi-purpose food have been indicated. Results of the human feeding trials show that the supplementary value of food processed here is slightly better than that of the American Multi-purpose Food.

10. INFLUENCE OF SULPHAGUANIDINE ON THE INTESTINAL FLORA AND THIAMINE SYNTHESIS BROUGHT ABOUT BY CURD FEEDING. S. Balakrishnan and R. Rajagopalan, *Nature*, 1952, **171**, 608.

The coliform organisms in the fæces and intestinal thiamine synthesis in rats are markedly suppressed by sulphaguanidine. But when curds are administered along with sulphaguanidine, the suppression of the intestinal synthesis and coliform organisms are considerably reduced. Curds seem to exert an antagonism towards the effect of sulphaguanidine, just like *para*-aminobenzoic acid.

11. SOME STUDIES ON THE DESTRUCTION OF AMINO ACIDS IN PROTEINS CAUSED BY AUTOCLAVING IN PRESENCE OF GLUCOSE. K. V. Giri, P. B. Rama Rao and R. Rajagopalan, *Food Research*, 1953, **18**, 217.

Casein, gelatin, albumin and fibrin were autoclaved with glucose and the loss of amino acids of the proteins after hydrolysis was investigated by circular paper chromatographic technique. It was found that autoclaving casein-glucose mixture for one hour resulted in complete destruction of arginine and of about 50% of lysine-histidine on a combined basis. Tyrosine and cystine were destroyed to a small extent after autoclaving for 8 hours. Studies with other proteins (gelatin, fibrin and albumin) show varying percentage losses of the same basic amino acids.

Sanitation Biochemistry

12. THE SPECIAL SIGNIFICANCE OF CERTAIN PERITRICHOUS CILIATE PROTOZOA IN THE AEROBIC PURIFICATION OF SEWAGE. S. C. Pillai, *Indian Medical Gazette*, 1952, **87**, 411–14.

The literature on the protozoa in relation to sewage treatment is briefly reviewed, and the evidence that has been accumulating at Bangalore on the importance of protozoa such as the species of *Vorticella*, *Carchesium*, *Zoothamnium*, *Epistylis* and *Opercularia* in the purification of sewage under different conditions is discussed.

13. OBSERVATIONS ON THE MICRO-ORGANISMS IN DECOMPOSING SEWAGE SLUDGE. S. C. Pillai and G. J. Mohan Rao, *Science and Culture*, 1952, **18**, 147–48.

Under certain conditions, decomposing sewage sludge has been found to contain cysts of *Vorticella* sp. constituting practically the only type of non-bacterial life in the sludge. When such sludge was inoculated into heat-sterilised sewage and aerated, the cysts developed and the protozoan multiplied in large numbers; after aeration for 44 hours, each c.c. of the suspension contained 2,400 active *Vorticella* sp., and the sewage was found clarified. These observations lend further evidence on the special significance of *Vorticella* in the aerobic purification of sewage.

14. INFLUENCE OF FILTERING MEDIUM ON THE CLARIFICATION OF SEWAGE IN BIOLOGICAL FILTERS. S. C. Pillai and G. J. Mohan Rao, *Science and Culture*, 1952, **18**, 289–90.

With a view to studying the efficiency of sewage filtration as influenced by different media, experiments were carried out with freshly broken pieces (about $\frac{1}{2}''$ size) of granite, pumice, charcoal, coal as also glass beads (about $\frac{1}{8}''$ dia.), coarse sand, clay, sandy-clay mixture (1 : 1), sand sieved through different meshes, *e.g.*, 4–10, 10–20, 20–30, 30–40, 10–40, 40–60 and 60–80 and unglazed porcelain filter tube ($\frac{1}{8}''$ thick). The "40–60" and "60–80" mesh filters were found to yield much clearer effluents, and these filters contained a large number of protozoa such as the species of *Vorticella* and *Epistylis*.

15. EFFECT OF CERTAIN ANTIBIOTICS ON ACTIVATED SLUDGE. S. C. Pillai, A. V. S. Prabhakara Rao, G. J. Mohan Rao, *Science and Culture*, 1953, **18**, 545–46.

The effect of aureomycin, streptomycin and penicillin on the activated sludge process of sewage purification was studied. The process was found

"sensitive" to these antibiotics, more especially to aureomycin which (4 parts per 100,000) adversely affected the clarifying action of the sludge. The adverse effect of the antibiotic treatment was traced to the inactivity of the beneficial forms of protozoa (*e.g.*, *Epistylis* sp.) in the sludge. The related observations are described and their significance indicated.

Chromatography

16. Sodium 1 : 2-Naphthoquinone-4-sulphonate as a Reagent for Identification of Amino Acids and Peptides and for Quantitative Estimation of Proline and Hydroxyproline Separated on Paper Chromatograms. K. V. Giri and A. Nagabhushanam, *Naturwissenschaften*, 1952, **39**, 548.

A modified method using sodium 1 : 2-naphthoquinone-4-sulfonate (0·1% in aqueous acetone) as a spraying reagent for the identification of amino acids on filter-paper has been reported. Most amino acids produce bluish green colours except proline and hydroxyproline which yield an orange colour. It is suggested that this difference in colour may be taken advantage of for confirming the presence of proline and hydroxyproline. The method also facilitates the detection of γ-aminobutyric acid in biological materials. It is also shown that proline and hydroxyproline can be estimated with reasonable accuracy by the use of this reagent.

17. Simple Paper Chromatographic Technique for Amino Acid Analysis of Blood. K. V. Giri, K. Krishna Murthy and T. A. Venkitasubramaniam, *Lancet*, 1952, p. 562.

A brief description of the circular paper chromatographic technique of Giri and Rao, as applied to the study of the amino acid patterns of blood is given.

18. Separation and Estimation of Overlapping Amino Acids by Circular Paper Chromatography Using Different Solvent Mixtures. K. V. Giri and N. A. N. Rao, *Curr. Sci.*, 1953, **22**, 114.

A technique is described for the resolution of amino acids which separate together as one band on chromatograms developed with butanol-acetic acid-water solvent. The single band of a particular amino acid group separated on the chromatogram run with *n*-butanol-acetic acid-water was cut out and a separate chromatogram was run for each group of amino acids using pyridine-water solvent—the cut out paper strips being used as 'wicks' for second development. It is reported that quantitative recovery of amino acids is possible by the application of this method.

19. PRESERVATION OF PAPER CHROMATOGRAMS. K. Krishna Murthy, T. A. Venkitasubramaniam and K. V. Giri, *Curr. Sci.*, 1952, **21,** 252.

Paper chromatograms of amino acids stained with ninhydrin were kept in a vacuum desiccator for 2 months without fading. Preservation in dry N_2 or at low temperature in a closed container was effective.

20. SOME FACTORS INFLUENCING THE QUANTITATIVE DETERMINATION OF AMINO ACIDS SEPARATED BY CIRCULAR PAPER CHROMATOGRAPHY. K. V. Giri, A. N. Radhakrishnan and C. S. Vaidyanathan, *Anal. Chem.*, 1952, **24,** 1617.

Some factors which affect the tone and colour intensity of the ninhydrin stained bands of amino acids separated by circular paper chromatography has been investigated. The bluish-violet colour of the alcoholic eluate of the bands is changed to reddish purple on the addition of copper sulphate. The relation between the distance travelled by the band, the area of the band and the colour density of the alcoholic eluates of the coloured bands has been studied. In the light of the results obtained, a quantitative procedure for the accurate determination of amino acids separated by circular paper chromatography has been described.

21. THE OCCURRENCE OF γ-AMINO BUTYRIC ACID AND GLUTAMIC ACID DECARBOXYLASE IN RED YEAST (*Rhodotorula glutinis*). P. R. Krishnaswamy and K. V. Giri, *Curr. Sci.*, 1953, **22,** 143.

By the use of Circular Paper Chromatographic Technique, γ-amino butyric acid was detected in the acid hydrolysate of red yeast "*Rhodotorula glutinis*". The cell suspension of the yeast was found to have significant glutamic acid-decarboxylase activity. The optimum pH was 4·5.

Enzymes

22. STARCH-SYNTHESISING ENZYMES OF GREEN GRAM (*Phaseolus radiatus*). J. Sri Ram and K. V. Giri, *Arch. Biochem. Biophys.*, 1952, **38,** 231–36.

Green gram contains phosphorylase and an enzyme resembling Q-enzyme which converts amylose to amylo-pectin. The enzymes were isolated from aqueous extracts of green gram by fractional precipitation with ammonium sulphate. The phosphorylase has its maximum activity at pH 6·3. The optimum temperature is 55° C. KCN, $HgCl_2$ and $AgNO_3$ completely inactivated it. Salivary amylase, β-amylase of sweet potato and soyabean and aqueous extracts of wheat and barley completely inhibited the enzyme even at very low concentrations. The optimum temperature for Q-enzyme was 24° C.

23. A SIMPLE PAPER CHROMATOGRAPHIC METHOD FOR THE STUDY OF TRANSAMINATION REACTIONS. K. V. Giri, A. N. Radhakrishnan and C. S. Vaidyanathan, *Nature*, 1952, **170**, 1025.

A highly sensitive, simple and rapid method is described for the detection and estimation of transaminase activity in plants using circular paper chromatography. The progress of the reaction was followed quantitatively by estimating the amino acid formed.

Pharmacology Laboratory

24. PAPYROGRAPHIC SEPARATION AND LOCATION OF ANTIBIOTICS FROM PLANTS. M. Sirsi, D. S. Venkatesh, B. Bheemeswar, and M. Sreenivasaya, *Curr. Sci.*, 1951, **126.**

The leaves of *Toddelia aculeata* (Syn. *Kadu Menasu*), a reputed indigenous drug, has antibiotic activity against *Bact. flexneri*: a papyrographic separation of the active principles has been attempted. The method of combining bio-autographic technique with the ultraviolet printing of the papyrogram has immense potentialities of application in a study of antibiotics from natural sources.

25. ANTIMICROBIAL ACTION OF VITAMIN C ON MYCO. TUBERCULOSIS AND SOME OTHER PATHOGENIC ORGANISMS. M. Sirsi, *Ind. Jour. Med. Sci.*, 1952, **6**, 252.

Vitamic C is known to endow the individual with increased powers of resistance to infection. Whether the effect was the result of nonspecific reactions or the vitamin exerted a specific action on the microbes was the subject of this study.

Vitamin C does not inhibit the growth *in vitro* of Staphylococci, Streptococci, *B. Coli* and *E. typhosus* to the same extent as *Myco. tuberculosis* in comparable dilutions.

26. BIOLOGICAL STANDARDIZATION OF DIGITALIS USING DOGS. V. Ramamurthy, A. S. Ramaswamy and N. N. De, *Curr. Sci.*, 1952, **21**, 47.

Bioassay of tincture digitalis using dogs as experimental animals has indicated that dogs which are more easily available than cats in this country, can replace the cat without any sacrifice of the accuracy of the results.

27. CEPHARANTHINE IN EXPERIMENTAL TUBERCULOSIS. M. Sirsi and N. N. De. *Ind. Med. Gaz.*, 1952, **87**, 91.

Great interest is now being evinced in the active principles of plant origin possessing anti-tubercular properties. The claims by Hasagewa that

Cepharanthine, an alkaloid from the roots of *Stephania cepharantha*, has tuberculostatic properties, have been investigated both *in vitro* and in experimental murine tuberculosis. The alkaloid inhibits the growth of Myco. tuberculosis in 2 mg./c.c. concentration and is found to be ineffective in controlling the disease process in mice.

Miscellaneous

28. THE OCCURRENCE OF A BLOOD ANTICOAGULANT FACTOR IN THE LATEX OF *Carica papaya*. T. Ramakrishnan, N. C. Pillai and K. V. Giri, *Curr. Sci*, 1952, **21**, 251–52.

Two factors have been fractionated from the acetone-dried powder of papaya latex, one which accelerates and another which prevents the clotting of blood. The heat-labile clotting inhibitor was precipitated at 0·5 saturation of ammonium sulphate and the accelerator at 0·75 saturation. It was found that the anticoagulant loses its activity on long standing in aqueous solutions.

29. PROLINE AND HYDROXY PROLINE IN LEAVES. K. V. Giri, K. S. Gopalakrishnan, A. N. Radhakrishnan and C. S. Vaidyanathan, *Nature*, 1952, **170**, 579.

The amino acids present in leaves of various plants were studied by circular paper chromatography. Among the plants investigated those belonging to the genus *Citrus* and family *Rutaceæ*, contained high concentrations of free proline in their leaves. Fresh sandal leaf extracts (*Santalum album*) showed a very high concentration of hydroxyproline which is the first record of free hydroxyproline in high concentration in leaves.

30. NON-ENZYMATIC TRANSAMINATION BETWEEN α-AMINO ACIDS AND KETO ACIDS. K. V. Giri and G. D. Kalyankar, *Naturwissenschaften*, 1953, **40**, 224.

It is reported that non-enzymatic transaminations take place between α-amino acids and α-keto acids when the mixtures are dried on filter-paper at high temperatures (over 80° C.). γ-Amino-butyric acid, β-alanine and proline did not show any transamination reaction under identical conditions.