West effect and an altitude effect. These results can be very well interpreted according to the theory of the motion of electrons round a magnetic doublet (earth being considered as a magnetic doublet), a theory first enunciated by C. Stφrmer of Norway, who interprets the origin and forms of *aurora-burealis* and the same theory has been extended by Lemaitre and Vallarta to interpret the asymmetric distribution of cosmic ray intensity on the basis of the corpuscular hypothesis. The investigations of the Italian school led by Rossi gave similar evidence for the existence of the asymmetry. Johnson's investigations on the distribution of the cosmic ray intensity support the corpuscular hypothesis and suggest that the corpuscles should consist exclusively of positrons. Clay has, recently, come to the conclusion that the primary radiation is of corpuscular nature, consisting of electrons, positive and negative, with energy 1·200 million electron-volts, and that this corpuscular radiation produces ultra-gamma photon radiations with energy $10^7$–$10^{10}$ *e*-volts. This produces secondary corpuscular radiation with $10^6$–$10^9$ *e*-volts, which in turn produces gamma radiation with energy $10^8$–$10^7$ *e*-volts, which finally produces the corpuscular radiation with energy amounting to $10^7$ *e*-volts.

Skobelzyn, Anderson and their co-workers and also Blacket and Ochialini have obtained beautiful photographs of the showers of the corpuscular tracts in the Wilson Chamber. These showers are the paths of the secondary particles diverging generally from a point in the material enclosing the Chamber. Many other aspects of these showers have been examined by other investigators.

The question of the fluctuations in the intensity of cosmic radiation, has attracted a good deal of attention. In the year 1927, Hoffmann discovered the occurrence of sudden bursts of ionisation at certain times. This phenomenon was disputed by the workers of the Millikan school who attributed it to the discharge of the battery in the instrument employed for recording the ionisation. Swann and Compton have shown that Hoffmann's observation was not due to the battery, and more recently Hoffmann has shown that the phenomenon is genuine and is really fundamental. Dr. and Mrs. Montgomery investigated the dependence of the Hoffmann Strosse on the altitude and on the thickness of the material of the ionisation chamber. When the number of the ions are of the order $\cdot 5\times10^5$, the rate of occurrence of the bursts at Swarthmore (61 m.) was 0.4 per hour while it was 260 per hour at Pike's Peak (4300 m.). When the number of ions is greater, of the order $1.5\times10^6$ they found no appreciable difference in the frequency of occurrence between Swarthmore and Pike's Peak. They also found that the bursts increased with the thickness of the shielding. Thus this new kind of very penetrating radiation, coming in from outside, possesses many new and interesting properties.

N. S. N.

---

## Academies and Societies.

### Indian Academy of Sciences:

*October* 1935. SECTION A.— S. M. SHAH: *On Inequalities Satisfied by Certain Arithmetical Functions II.* D. D. KOSAMBI: *An Affine Calculus of Variations.* S. R. SAVUR: *A Simple Test of Value of a Particular Period in Forecasting.* S. BHAGAVANTAM: *Rotational Raman Scattering in Benzene.*—Results with a high dispersion spectrograph confirm those obtained hitherto with low dispersion instruments. The observations of Sirkar and Maiti are not confirmed. S. RAMA SWAMY: *X-Ray Analysis of the Structure of Iridescent Shells.—Part II.—The Haliotidæ.*—There is a preferred orientation of the *a* and *b* axes with a large error in the orientation. W. M. VAIDYA: *The Flame Spectra of Some Aromatic Compounds.*—The bands attributed to HCO are found to occur. The hypothesis of direct incorporation of the $O_2$ molecule explains the spectroscopic observations better than that of successive formation of hydroxyl groups. D. S. SUBBARAMAIYA: *Light Scattering in Gold Sols in Relation to Particle Size and Shape.*—In all the sols examined the shapes of the particles are far from being spherical. K. L. RAMASWAMY: *Dielectric Coefficients of Volatile Compounds of Fluorine and Boron.*—The moments of $CF_4$, $NF_3$, $(CF_3N)_2$, $B_2H_6$ and $B_3N_3H_6$ have been determined in the vapour state, and their structures discussed. BAWA KARTAR SINGH AND I. MAHANTI: *The Physical Identity of Enantiomers.—Part I.*—Rotatory dispersion of *l*-Borneol, enantiomeric camphors, camphoric acids, sodium camphorates, camphoric anhydrides, and camphorimides. S. CHOWLA: *A Remarkable Property of the "Singular Series" in Waring's Problem and Its Relation to Hypothesis K of Hardy and Littlewood.* T. A. VAHIDY AND K. C. PANDYA: *The Condensation of Aldehydes with Malonic Acid in the Presence of Organic Bases.—Part IV.* The Condensation of Piperonal. C. V. RAMAN AND N. S. NAGENDRA NATH: *The Diffraction of Light by High Frequency Sound Waves.—Part I.*—A theory of the phenomenon is developed and the calculations interpret the experimental results of Bär in a very gratifying manner. C. V. RAMAN & N. S. NAGENDRA NATH: *The Diffraction of Light by Sound Waves of High Frequency.—Part II.*—The new theory is extended to the case when the light beam is incident at an angle to the sound wave fronts. The results explain the variations of the intensity among the various orders noticed by Debye and Sears for changes in the angle of incidence.

*October* 1935. SECTION B.—K. RAMIAH AND S. RAMANUJAM: *Chlorophyll Deficiencies in Rice* (Oryza sativa).—Nine types of Mendelian chlorophyll deficiences consisting of both unicoloured and variegated forms have been described and their inheritance discussed. Some of these like the "zebra-marked," lutescent, and certain variegated forms are recorded for the first time in rice. N. L. SHARMA AND S. PURKAYASTHA: *The Heavy Minerals of the "Erinpura" Granite and Microgranite of Danta State (N. Gujrat).*—Twenty

specimens of granite and six of microgranite from the main exposures of the "Erinpura" rocks have been analysed from their heavy minerals. M. DAMODARAN AND M. SRINIVASAN: *Ascorbic Acid (Vitamin C) Content of Some Indian Plant Materials.*—The ascorbic acid contents of a number of indigenous plant materials have been tabulated. The Indian gooseberry gives the highest reducing value by the Tillmann-Harris technique among the materials examined (See *Curr. Sci.*, 1935, **3**. 353). B. N. SINGH: *The Correlation between Life Duration and Respiratory Phenomena.*—The study of the respiratory index of short-lived and long-lived plants has revealed characteristic differences between the two classes of plants. In the short-lived plants, the index decreases for an early phase of the fourth cycle, the rate of fall becoming more pronounced before the initiation of the reproductive organs. In the long-lived plants, on the other hand, the rate is more or less steady and shows a stop only towards the end of the growth cycle. J. DAYAL: *Studies on the Trematode Parasites of Indian Fishes I.*—A New Trematode, *Monorchotrema taakree* n. sp. from a Fresh Water Fish, *Pseudeutropius taakree*, from Lucknow.—A trematode of the family Heterophyidæ found as an adult in the intestine of a fish (*Pseudeutropius taakree*) has been described. S. B. KAUSIK: *The Life-History of* Lobelia trigona *Roxb. with Special Reference to the Nutrition of the Embryo-Sac.*—The nutritive mechanism of the embryo-sac has been described.

# University and Educational Intelligence.

## Annamalai University:

1. *The Founder's Day.*—The Sixth Founder's Day was celebrated on the 12th October, 1935, under the presidency of the Right Hon'ble V. S. Srinivasa Sastri, P.C., C.H., LL.D., Vice-Chancellor of the University. Captain M. Abdul Hamid, M.A. (Oxon.), Principal, Government Mohammedan College, Madras, delivered the Address.

2. *Convocation.*—On the 31st October, 1935, the Fifth Convocation of the University for conferring degrees, diplomas and titles was held when His Excellency Lord Erskine, G.C.I.E., Governor of Madras and Chancellor of the University, presided. Sir Mirza M. Ismail, KT., O.B.E., Dewan of Mysore, delivered the Address to the graduates. 103 candidates were presented at the Convocation besides 44 who took their degrees and titles *in absentia.*

An ordinary meeting of the Senate was held on the same day at 3 P.M. The following resolutions moved by Mr. G. Srinivasa Ayyar were adopted:—

i. The Senate recommends that a Bureau of Information of careers for graduates be opened at the University to provide facilities for the employment of the graduates.

ii. The Senate resolves that an official register of the graduates of the University be maintained and revised every year to give particulars of their address, employment and achievements.

The Senate also approved of the proposal of the Syndicate to institute for a period of 3 years a teaching post in the grade of a lecturer for the Department of English, in view of the large number of students admitted this year and the additional work entailed thereby.

3. *Special Lectures.*—On the invitation by the Syndicate, the following persons delivered courses of special lectures during October, 1935;—

Dr. H. Parameswaran—3 lectures on "Vacuum Technology." Prof. P. Sambamurthy—4 lectures on "South Indian Music," with an Orchestral Concert on the 2nd November.

4. *Library.*—The University Library has been re-organised with a view to making it more useful to the staff and students. Provision has been made for a spacious reading room and arrangements have been made for the Library to work from 7 A.M. to 7 P.M. on all days of the week including Sundays.

5. *Inter-Collegiate Debate.*—Under the auspices of the University Union, an inter-collegiate debate was held on the 19th October in which representatives of the Madras Colleges (Presidency, Christian, Pachaiyappah's and Loyola) participated. The subject of the debate was:

"That Science can achieve the moral well-being of humanity more effectively than religion."

Messrs. C. Jagannathachari of the Annamalai University and K. Rangachari of the Christian College, Madras, were adjudged the best speakers and awarded a prize each.

Under the auspices of the Sanskrit Society, M. R. Ry. K. Balasubrahmanya Ayyar Avl., B.A., B.L., Madras, delivered the Inaugural Address. The occasion was availed of to have the portrait of Mahamahopadhyaya Vidyavachaspati S. Kuppuswami Sastriar, M.A., I.E.S. (Retd.), Professor of Sanskrit and Comparative Philology, Presidency College, Madras, unveiled by the Vice-Chancellor.

6. *Talks on Popular Subjects.*—A system by which a member of the Staff gives a talk to the students every week or a fortnight on a subject of popular interest, was inaugurated in September last by the Vice-Chancellor.

The following members of the Staff gave talks on the following topics:

The Vice-Chancellor: on "The Italo-Abyssinian dispute."

Prof. M. S. Sundaram: on "The Far East."

Mr. V. R. Viramani: on "The Sanctions."

7. *Elections.*—The Elections to the several University authorities that are now being reconstituted are in progress and the new bodies will function from 6th December 1935.

## Andhra University:

The following candidates have been qualified to receive the degrees noted below:—

*Doctor of Philosophy:* A. Veerabhadra Rao, M.A. Title of Thesis: "Studies on Raman Effect." I. V. Radhakrishna Rao. Title of Thesis: "Sirrhosis of the liver in Northern Circars."

*Master of Science:* Mr. D. S. N. Murti, B.A. Title of Thesis; "Isomerism in Organic Chemistry."