OBITUARY

DR. A.K. DAS (1902-1961)

D

On 18th February, 1961 India lost her greatest astronomer of the 20th Centruy in the passing away of DR. ANIL KUMAR DAS, D.Sc., FRAS., FNI, till lately Deputy Director General Astrophysical Observatory, kodaikanal. At the time of his death, Dr. Das was holding the post of Director, Nizamiah Observatory Hyderabad, and Professor of Astronomy, Osmania University, a post which he held hardly for ten months. He left Kodaikanal in April, 1960 after a distinguished service of 30 years with the India Meteorological Department. He was head of Kodaikanal Observatory for 14 years; the logest period an Indian held the post ever since the establishment of Kodaikanal Observatory.

Dr. Das had all the qualities of a great research worker. Keen foresight, grim determination, untiring energy and genuine affection for colleagues and research workers in his observatory are some of them. He had made many significant and outstanding contributions which have already spread his name far and wide and made him one of the foremost atrophysicists in the world. But the greatest of his achievements is undoubtedly the improvements he effected, new equipment he added and new fields of research he initiated at the Kodaikanal Observatory.

Anil Kumar Das was born on 1 February, 1902 at Chinsura Hoogly, West Bengal. He had his schol education in High English School Chaudanga, Nadia, and Government School, Murshidabad, Bengal. He then joined the Berhampore College and passed the I.Sc. examination. Das came to Calcutta and joined the Presidency College and took Honours in Physics in his B.Sc. course. He passed B.Sc. examination in 1922. In M.Sc., which he passed in 1924, Das stood first in the first clas. Das left for France in 1925 to work at the Paris University. He joined the Laboratoria de Physique, University of Paris, and started work on Spectroscopy under late Prof. Ch. Fabry. He was awarded in 1928

the degree of'Doctor of Sciences' by the Paris University on his dissertation "Studies on the Absorption Spectra of Halogens". D For the next two years, Dr. Das worked with Prof. Max Born at the Institute für Theoretische Physik and with Prof. Augenheister at the Geophysikalisches Institut, Gottingen.

Dr. Das joined the India Meteorological Department on 8th March, 1930. His first posting was at Poona where he was to work on "Weather Forecasting". Within a month he was transferred in the same capacity to Calcutta (Alipore) to do the same work, and remained there till August, 1934. During this period Dr. Das published quite a few papers on weather forecasting, tornadoes, thundersqualls etc. In September 1934, Dr. Das proceeded to England on study leave and stayed there for nearly a year. During this period he was associated with Prof. F.J.M. Stratton, Director Solar Physics Observatory, Cambridge, and worked on Spectrophotometric investigations of the temperature of the sun. Dr. Das came back to India in ~~AUGUST 1935 AND WAS POSTED AT~~ August, 1935 and was posted at Agra as an Assistant Meterologist in the Upper Air Observatory to work on instrumentation. He remained at Agra till September, 1937.

Dr. Das initiated researches in cosmic rays at Agra and later started the same work at Kodaikanal. He published a paper in Indian Journal of Physics [14-(1940)-191] on "Measurement of Cosmic Rays at Agra and Kodaikanal". Work on cosmic ray had not begun in India except for a few measurements directly sponsored by Compton and Millikan and this is the first account of a systematic investigation of the variation of cosmic ray intensity at two widely different places varying in latitudes as well as in altitudes. Dr. Das had an intuitive foresight into the shape of things to come. We find in this paper an attempt to correlate solar phenomena with cosmic ray intensity. Although, the analysis proved inconclusive, it clearly indicated the trend of his thought for now we know for certain that intense flares do produce cosmic rays.

In September, 1937 Dr. Das was appointed the Assistant Director, Kodaikanal Observatory. He worked in this post till June, 1942. During this period came a series of remarkable papers on solar prominence and motion of gases in the sun's atmosphere. That the sun exercises an over riding influence on the earth's atmosphere needs no reminding; but the reverse effect whose possibility was suspected by Evershed, Ryods and others was yet to be established. Dr. Das, in a statistical analysis of 14 years' data, published in Indian Journal of Physics [14 (1940), 311], showed that the area of Calcium Prominences was indeed maximum in January and minimum in July. The earth at its perihelion is 3 million miles nearer in January and the increased gravitational attraction on the sun causes a corresponding increase in the area of the prominences. This increase was found to vary in accordance with an approximate inverse cube law of distance between the sun and the earth- thus confirming the gravitational theory.

In a series of papers on "The Motion of Gases in the Sun's Atmosphere"(Parts I to IV), published in Indian Journal of Physics during the years 1940 to 1942. Dr. Das attempted to work out a unified theory based on simple particle dynamics to explain many of the hitherto unexplained behaviours of solar happenings. The magneto-hydrodynamical theory of Alfven, developed a few years later, attempted to do the same thing, but the deduction was rather involved and complicated and was not really very satisfactory. Dr. Das postulated that the matter taking part in these phenomena has its origin in the core of the sun which roughly corresponds to a sphere of 1/3rd the radius of the sun. This core is highly convective and gives off matter through some eruptive processes. The matter, thus ejected, eventually reaches the photosphere and beyond, its motion outside the photosphere

being determined by purely dyanmical laws. If the gaseous matter is supposed to issue radially from the photoshpere with a small velocity [Ind. J. Phys., 15 (1941),79], it does not rise much above the photosphere; while merging out of the photosphere it is also acted upon by the equatorward force which exists on the photosphere. This dynamical mechanism can quantitatively explain the formation of quiescent prominences, absorption markings, chromospheric eruptions and many ohters. In later years, Dr. Das extended this theory to explain the behaviour of sunspots.

Quite early in the picture, Dr. Das realized the importance of other geophysical researches to supplement purely astronomical observations for a better and more thorough understanding of the processes involved. Location of Kodaikanal is unique for research potential in certain branches of astrophysics and geophysics. Its geographical latitude is 10° N. and geomagnetic latitute is 1/2° N. Simultaneous investigations of geomagnetism, ionosphere, solar activity and others are of the highest scientific importance. Dr. Das took full advantage of the situation and carefully planned advanced researches on all the subjects at Kodaikanal.

A new magnetic observatory was established in 1948. The instruments consisted of horizontal force, vertical force and declination magnetographs of Watson type for continuous photographic registration of the magnetic elements. A La Cour Magnetograph was added in June 1951.

Investigation of ionosphere near geomagnetic equator has great physical significance. In 1951, Dr. Das installed a C-3 automatic ionospheric recorder and organized a division of Radio Astronomy. Two 'radio telescopes' on 100 and 200 mc./s. employing Ryle's interferometer technique are working at Kodaikanal since 1951.

The Solar Physics Division was, and still is, the most highly developed branch of the observatory. This was natural as this division was doing excellent work over half a century. The

observatory was already equipped with a fair number of optical telescopes and spectrographs including both H-alpha spectro-helioscope and K and H- alpha spectroheliographs. But new and more powerful equipment were lacking and to these ends Dr. Das devoted his whole-hearted attention. He installed Lyot's Coronagraph for observing corona and coronal streamers. The Monochromatic Heliograph is another of Lyot's inventions to study chromosphere and connected solar phenomena in a part of the red H-alpha line of the hydrogen atom. Dr. Das obtained the interference polarizing filter from France and had the Heliograph mounted on the same equatorial stand as the Coronagraph. Dr. Das also organized the construction of a large solar telescope combined with a powerful spectrograph of exceptionally high dispersive and resolving powers.

Dr. Das, while engaged in a large-scale improvement of the observatory, kept up his scientific contributions and wrote a large number of papers on a variety of subjects. Shortly before his death Dr. Das published another interesting paper "The Solar Cycle and the Associated Behaviours of Sunspots and Prominences" in the Kodaikanal Observatory Bulletin (11 April 1959.) In this paper, Dr. Das attempted to explain the origin and behaviour of sunspots and prminences from purely dynamical considerations. Dr. Das organized solar eclipse expeditions to Iraq for taking observations during the solar eclipse of 25 February 1952 . He again organized a similar expedition to Ceylon for the total eclipse of 20 June 1955. The weather was unkind during both these expeditions. Dr. Das foreseeing such a possibility equipped the 1955 expedition with radioastronomical and magnetic instruments and collected valuable information.

Many an honours were showered upon Dr. Das. He was elected a Fellow of the Royal Astronomical Society of England and a Fellow of the National Institute of Sciences, India. The Universities often requested him to give lectures. In recognition of his distinguished services, the President of India awarded PADMASHRI

to him on the Republic Day, 1960.

Dr. Das had a genuine and abiding affection for Kodaikanal. With a singular devotion to scientific research, he worked with untiring energy to build up an institution of research. In Kodaikanal today, there are advanced researches observations with the finest equipment on Solar. and regular corona, flares, faculae, flocculi, prominences, sunspots, on ionosphere, earth's magnetic field, cosmic rays, radioastronomy, seismology and, last but not of least importance, the meteorology. The task Dr. Das undertook upon himself is now complete. But he did not have the opportunity of working with the instruments he built through years of toils and strife; most of the equipments were completed just before he left Kodaikanal. Dr. Das had one ambition in life and which he had expressed on many occasions. He wanted to work at Kodaikanal during the last years of his life and perhaps end his life there happily amongst his own creations. In fact the assignment he took at Hyderabad was only for three years; thereafter he wanted to proceed to Kodaikanal and already wrote to the authorities for permission to this effect. But God ordained otherwise. He died within a year of his leaving Kodaikanal with his last aspiration not fulfilled.

May his soul rest in peace.

(S.N. MITRA.)