

## NEWS AND VIEWS

## Copernicus and his Influence on Astronomical Thought

It is just four hundred years since Copernicus died. A very short time before his death the first printed copy of his work, "De Revolutionibus Orbium Coelestium", was placed in his hands, but in his semi-conscious state he was unable to realize the implications of his views expressed in his book, or the revolution which they were destined to effect in scientific thought. Before his time the Aristotelian scheme of cosmology was generally accepted—the earth being the centre of a system of spheres, to which the planets were rigidly attached. Outside this system was another sphere to which the stars were attached, and this sphere, with the stars, rotated once in twenty-four hours. To account for the erratic motion of the planets it was believed that the planetary spheres rotated in a direction opposite to that of the sphere of stars, but were dragged along by the superior force. Saturn was then considered the outermost planet and therefore nearest to the stellar sphere; for this reason it had the greatest difficulty in overcoming the force of the stellar sphere, and hence required a long time to complete a revolution. In contrast with Saturn the moon—the nearest to the centre—had little force to overcome and so completed a revolution in the least time.

Such, in brief, was the system which Copernicus found when he took up the study of astronomy, and it is against the background of such a cosmology that we must judge his greatness to-day. He introduced simplicity into the generally accepted scheme by postulating a rotation of the earth once in twenty-four hours and an annual motion round the sun. By means of the old devices of eccentricities and epicycles and these two postulates, he worked out the astronomical consequences. Among the ancients there were some who had taught that the earth was in motion, but their ideas were mere philosophical speculations, and they had not developed them into a systematic scheme. To Copernicus alone belongs the honour for the heliocentric scheme which was destined to revolutionize the course of astronomy. In another part of the present issue there appear two synopses of the life and work of Copernicus, which demonstrate the debt that the world of astronomy owes to one who stands out as a great thinker and who made possible the developments which afterwards took place under Kepler and Newton.

## Sylvestre-Francois Lacroix (1765–1843)

IN his "Passages from the Life of a Philosopher", where he refers to the works he studied at Cambridge, Charles Babbage said: "In 1811, during the war, it was very difficult to procure foreign books. I had heard of the great work of Lacroix, on the 'Differential and Integral Calculus', which I longed to possess, and being misinformed that its price was two guineas, I resolved to purchase it in London on my passage to Cambridge. As soon as I arrived I went to the French bookseller, Dulau, and to my great surprise found that the price of the book was seven guineas. After much thought I made the costly purchase, went on immediately to Cambridge, saw my tutor Hudson, got lodgings, and then spent the greater

part of the night turning over the pages of my newly-acquired purchase".

The author of this work, Sylvestre-François Lacroix, was for more than half a century one of the foremost teachers of mathematics in Paris, in which city he was born and died. His death took place on May 25 a century ago. A pupil of Monge, his first appointments were in naval and military schools, and then in 1794 he was given an important post in connexion with the re-organization of public instruction. He also held a chair in the short-lived Ecole Normale, and afterwards held professorships at the Ecole Polytechnique, the Collège de France and the Sorbonne, at the last of which at one time he had as colleagues Biot, Poisson, Francœur and Hachette. His book on the calculus was but one of several of his mathematical text-books, but it was probably the most important. Having read his own copy, Babbage drew up a sketch of a society to be formed for translating an earlier and smaller work by Lacroix on the same subject, and thus the Analytical Society came into existence in 1813, Herschel and Peacock being among Babbage's chief supporters. The Society published its translation of the "Traité élémentaire" in 1816, and in the following years the differential notation made its appearance in university examinations.

## Smithsonian Institution

THE report of the Secretary of the Smithsonian Institution for the year ending June 30, 1942, includes the financial report of the executive committee of the Board of Regents, together with a summary of the year's activities and reports on the United States National Museum, the National Gallery of Arts, the National Collection of Fine Arts, the Bureau of American Ethnology, the International Exchange Service, the National Zoological Park, the Astrophysical Observatory, the Division of Radiation and Organisms and on the Library. A War Committee has been appointed to facilitate the assistance of the war effort by the Institution, and in addition to preparing a detailed roster of the scientific staff, an index has been compiled of published and unpublished photographs taken by the scientific members of the Institution in all parts of the world for ready consultation by war agencies. Together with the National Research Council, the American Council of Learned Societies and the Social Science Research Council, the Institution has participated actively in setting up the Ethno-geographic Board. Under the editorship of Dr. Julian H. Steward of the Bureau of American Ethnology, the Institution has undertaken the publication of a handbook on the Indians of South America.

Another important Smithsonian publication will be a list of the insects of South and Central America, which will be a much-needed tool for future entomological work in these areas. The specialized geographical, racial and linguistic knowledge of the scientific staff of the Bureau of American Ethnology has been in constant demand by the Army, Navy and other war agencies, but the work of the International Exchange Service has continued to be greatly hampered by the War. The most important event of the year of the Astro-Physical Observatory was the publication of vol. 6 of the *Annals*, covering 1920–39. This volume is the culmination of seven years work on revision of the daily results of observation of the solar constant of radiation at the three field