reliable proper motions and accurate radial velocities existed gave the first conclusive evidence from observational data that the great stellar system was in rotation as postulated by Lindblad and Oort. This important research convincingly demonstrated that the sun and the local cluster of stars were describing Keplerian ellipses in the plane of the Galaxy, about a dynamical centre, 30,000 light years distant in galactic longitude 324°, in the direction of the constellation Sagittarius. The diameter of the stellar system was found to be 100,000 light years; the orbital velocity of the sun 275 kilometres per second; and the period for one complete revolution 224,000,000 light years. The observed stellar velocities gave a value of $1 \cdot 6$ by 10^{11} suns (160,000,000,000 suns) as the mass of the Galaxy approximately one-half being due to the 100,000,000,000 lucid stars of the system and one-half attributed to the extensive cloud of dark interstellar matter highly condensed in the galactic plane.

This interesting and highly important investigation provided an accurate and independent determination of the form, dimensions and dynamical constants of the Galaxy, and stimulated many studies of galactic structure in subsequent years. A systematic survey of some 700 fainter and more distant high temperature stars is currently being conducted by J. A. Pearce and R. M. Petrie, to study in greater detail stellar movements in various parts of the Galaxy. At the same time, regions nearer the sun are being investigated in order that an understanding of the dynamics of the Galaxy may, ultimately, be attained. In addition, dynamical studies are being made of special groups of stars, such as the Taurus Cluster, the Pleiades, and the Ursa Major Cluster. Fundamental work goes on in the study of wave-length standards and control stars in order that the highest possible accuracy be achieved in velocity results. With highly developed facilities for radial velocity work, the Observatory is making permanent and important contributions in the field of stellar dynamics.

Binary Stars.—The observation and study of binary stars is an important branch of modern astronomy, for such systems present an opportunity of studying the operation of gravitational forces outside the solar system. Moreover, these binary systems provide the only sure knowledge (except for the sun) about the masses, diameters, and densities of stellar bodies. Many of them have components so close together that they can never be resolved telescopically but are discovered by spectroscopic observations. Their binary character is revealed by a periodic variation in radial velocity as the stars revolve in their orbits. Such close systems, called spectroscopic binaries, are of great interest because, from an analysis of the orbital motion, the masses, radii, and other dimensions, of the component stars may frequently be determined.

The spectroscopic work at Victoria has resulted in the discovery of many spectroscopic binaries. At present, a total of more than 1,500 systems of this class is known and about one-third of these were discovered at the Dominion Astrophysical Observatory. Moreover, the Observatory has taken a prominent part in the detailed observation and calculation required to deduce orbital elements. The most recent catalogue (1936) lists determined orbits for 375 spectroscopic binaries and names this Observatory as the authority in 116 cases. The late Dr. William E. Harper devoted over 30 years to orbit work and computed the orbital elements of nearly 100 systems, twice as many as any other astronomer.

Emphasis has been placed upon the binaries composed of high temperature stars with the result that 70 p.c. of the most massive stars known to science were discovered and studied here. Outstanding contributions in this important field have