

## THE STRASBOURG CONGRESS

*Comptes Rendus du Congrès international des Mathématiciens* (Strasbourg, 1920). Publiés par Henri Villat. Toulouse, Édouard Privat, 1921. xlvii + 670 pp.

The Strasbourg Congress is particularly interesting as the first congress after the War, and its proceedings indicate the results of researches made during the War as well as forecast those to be made later. If the reader will glance at the list of topics in the volume, he will notice that many of those topics have continued to develop since the time of the Congress, and that some of them (for instance that of general complex numbers) have since then reached a certain definitive stage.

The mathematical part of the volume before us consists of five general lectures, by Messrs. Larmor, Dickson, de la Vallée-Poussin, Volterra, and Nörlund, and of 68 other papers and résumés of papers. Among the latter, 32 are in arithmetic, algebra and analysis, 10 are in mathematical physics and applied mathematics, and 9 are on questions philosophical, historical, and pedagogical. An adequate review of the volume would necessitate an analysis of each of these general lectures and papers; because of lack of space we give merely abstracts of the general lectures.

Larmor: *Questions in physical interdetermination.*

Sir Joseph Larmor's lecture is a masterly critical discussion of modern theories of spacetime, with particular reference to the two questions of physical interdetermination and of the postulation of a Hamiltonian principle of extremal variation of action.

There is complete statical interdetermination in a freely jointed frame of rigid bars without redundant members. Another instance of complete statical interdetermination is given by the newtonian potential, which is determined throughout free space or so long as no attracting matter is traversed, by its values in any region. This latter interdetermination holds for any isotropic uniform elastic medium, whether material solid or ether. Complete static interdetermination can take place only in real spaces; freedom demands that at least one dimension shall be imaginary. Radiation is the principal, if not the sole method of production of change of physical systems out of direct contact. If radiation it to take place in waves and if the medium is isotropic, time restricted to a single dimension, it can be shown that space must have three dimensions. The variation of the total intrinsic action of a physical system is postulated to be extremal. The space is thus considered to exist apart from the physical processes that take place in it. In special relativity, then, a space is characterized by its potentials. The moving