Geometria Proiettiva Differenziale. By G. Fubini and E. Čech. Bologna, Nicola Zanichelli, 1927. Vol. II, 406 pp.

The second volume of the Projective Differential Geometry of Fubini and Čech is a direct continuation of the first. Chapters, sections, and pages are numbered consecutively, the second volume beginning with Chapter 8, §71, page 389; and an index is provided at the end of the second volume for the entire work. Moreover, the continuity is not altogether mechanical. In the last chapter of the first volume it was proved that if a non-ruled surface in ordinary space is projectively deformable at all, then it is projectively deformable in ∞^3, ∞^2, or ∞^1 ways, and the concluding sections of that volume were devoted to a discussion of the first case. The opening chapter of the second volume completes the discussion of the other two cases.

Chapters 9 and 10 are devoted to a consideration of various portions of the projective differential geometry of a surface in the neighborhood of one of its points. Among the topics treated are the quadric of Moutard; Čech's transformation Σ between points in a tangent plane of a surface and planes through the contact point, with various special cases one of which is connected with a two-dimensional metric of Weyl; the canonical pencil of lines; and the cone of Segre. Arbitrary curvilinear coordinates are used in these chapters.

Complexes and congruences of lines are studied in Chapter 11. Here the closest possible analogy with the theory of surfaces is preserved. The theory proceeds from certain fundamental differential forms to the differential equations which determine the configuration except for a projective transformation. Much emphasis is placed on the notion of projective applicability of complexes and of congruences.

The projective differential geometry of hyperspace appears for the first time in Chapter 12. The now familiar transition is made from the fundamental differential forms for a hypersurface in S_n to the differential equations, which might themselves have been used as fundamental. Non-parabolic surfaces in S_4 are studied, and ruled surfaces in spaces of even and odd dimensions are briefly considered.

It seems appropriate to remark in this connection that a general projective differential theory of a V_k in an S_n, with $n>4$ and $1<k<n-1$, remains yet to be constructed. Two methods seem to be available for constructing such a theory, namely, the method of Wilczynski who starts with a system of differential equations and employs the Lie theory of continuous groups, and the method of Fubini who starts with a system of differential forms and employs the absolute calculus of Ricci. But the labor involved in the former method seems at present to be prohibitive, and the latter method has so far failed because of the lack of a suitable fundamental quadratic form, or perhaps because of the lack of a suitable absolute calculus for an n-ary p-adic differential form.

Nearly the last third of the second volume is occupied by four appendices written by three different authors. In the first appendix Tzitzeica treats in French a special problem in the deformation of surfaces. In the second Bompiani gives a systematic exposition of his own contributions to the projective differential geometry of curves and surfaces in ordinary space. Bompiani has been especially interested in geometrical definitions of the fundamental forms of Fubini. In the third appendix Terracini gives an exposition of the most interesting results in the projective differential geometry of hyperspace, accompanied by a valuable bibliography, and in the fourth the same author gives a brief account of a special problem concerning surfaces whose asymptotics belong to linear complexes.

These volumes constitute the only existing comprehensive treatise on the modern theories of projective differential geometry. Every one interested in this subject will need to have a copy of this work available, as references will be made to it for some time to come. There still seems to be room, however, for a well organized treatment in English of the same material. And most of all there is need for a text which can be put into the hands of graduate students who are being introduced to the subject, because the monumental work of Fubini and Čech, valuable as it is for the expert, does not seem to be suited to the needs of a beginner in this field.

E. P. LANE

Les Mathêmatiques du Chimiste. By L. Gay. Paris, J. Hermann, 1926. vii+208 pp.

As indicated by the title, this book is not a mathematics text, but rather a monograph embodying only those principles which the author believes to be of particular utility to the chemist; more especially to the physical chemist. Hence he has omitted all reference to trigonometric functions, polar coordinates, integrals of surfaces and volumes, the mathematics used in crystallography (believing this to belong to the realm of physics), and he has only touched on the subjects of limits, series, imaginaries, etc.

The scope of the book may be judged from the following consecutive chapter headings: powers and roots, logarithms, functions of a single variable, functions of more than one variable, differentials, derivatives of functions of more than one variable, integrals of functions of a single variable, and integrals of differentials which depend upon more than one variable.

It seems to the reviewer that Chapter one might have been omitted; surely every chemist must be familiar with its contents. Much of Chapter two, dealing with logarithms, might also have been deleted, especially the discussion of their use in multiplying, dividing, raising to powers, and extracting roots. However, the reviewer is pleased to find included in the chapter an explanation of the numerical values of logarithms of numbers less than one, and a discussion of the errors which may result from the use of logarithms in making computations. In Chapter three it seems scarcely necessary to explain how to plot using rectangular coordinates, or to point out that the graph of a first order equation is a straight line. Methods of interpolation and extrapolation are given the attention they well deserve. In Chapter four we find a goodexposition of the use of the triangle in representing systems of three components. In Chapter five are given the rules