Variétés Différentielles et analytiques, by N. Bourbaki. Hermann, Paris, 1967. 97 pages.

It is a great relief to see the "Fascicule de résultats" of Bourbaki's new series on Differentiable and Analytic manifolds. As far as the reviewer's knowledge (of the secret papers of Bourbaki) goes, this is the resume of a long promised and eagerly awaited treatise. The famous introduction to Differentiable manifolds by S. Lang has clearly indicated the pattern of this treatise (Lang refers to this volume in the foreword to his book). This book contains seven sections; a survey of the contents is as follows.

Section 1 deals with some basic facts about differentiable functions defined in normed spaces with values in another normed space and their standard properties. Section 2 is devoted to functions of class C^r, $r \neq o$, Taylor's formula and the implicit function theorem. In Section 3, the notion of a K-analytic function (K = R, C) is introduced and some of their standard properties (like the principle of analytic continuation) have been discussed.

Section 4 is particularly interesting from the point of view of algebraists and p-adic analysts; it deals with analytic functions defined in normed spaces over a non-archimidean field (sometimes of characteristic zero).

Section 5 introduces the notion of a Banach or Hilbert manifold using the notion of an atlas (due to Ehresmann). The notion of a submanifold, morphism between two manifolds and functions of class C^r over a manifold have been discussed. The existence of a partition of unity has also been discussed. The notion of a tangent space at a point (of a manifold), the notions of immersion, morphism étale", submersion and quotient manifolds have been discussed. The notion of subimmersion and fiber product have also been introduced. Finally the last part of this section deals with Lie groups and analytic groups.

Section 6 introduces (differentiable) fibrations (or fiber spaces), Principal fiber spaces and morphisms; the notion of a fiber space associated with a principal fiber space and the problem of restriction and extension of the structure group of a Principal fiber space have been thoroughly discussed. The (last) section 7 deals with vector bundles.

Bourbaki's new series on Manifolds is indeed a welcome addition to the literature; the clarity, style and the elegant presentation will profit greatly the beginner as well as the specialist. Needless to say, the world of mathematicians always owes a debt to this great teacher.

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