unitary group as the structure group; the condition that it reduces to the Levi-Civita connection of the Riemannian metric arising from the given Hermitian metric is equivalent to the Kähler condition. That such commutativity should be basic follows from the fact that the harmonic forms are defined relative to the Riemannian metric. Chapter V starts with an introduction to almost complex and complex manifolds and has as main purpose the derivation of Hodge's theorems. They are formulated in terms of pseudo-Kählerian manifolds; the proofs are identically the same as in the Kählerian case. Recently, L. Nirenberg and A. Newlander succeeded in proving that local complex coordinates can be introduced in a differentiable integrable almost complex structure. As a side result it seems that the adjective "pseudo" can now be dropped in the terminology of these classes of manifolds.

The book should be considered as an account of the author's own researches with sufficient introductory material and does not aim at completeness. For instance, two important topics, characteristic classes and locally flat spaces, are hardly touched. With this in mind the book is highly recommendable as an introduction to modern differential geometry.

S. S. CHERN

RESEARCH PROBLEMS

1. Richard Bellman: *Differential equations.*

Consider the Sturm-Liouville problem:

$$u'' + \lambda(f(x) + \epsilon g(x))u = 0, \qquad 0 < x < 1,$$
$$u(0) = u(1) = 0,$$

where $f(x)$ and $g(x)$ are continuous functions over $[0, 1]$ with positive minima.

Let us regard λ_1, the smallest characteristic value, as a function of ϵ. Is it true that λ_1 is an analytic function of ϵ for $R(\epsilon) \geqq 0$? In general, where is the singularity nearest the origin $(\epsilon = 0)$? (Received September 24, 1956.)