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RECENT DEVELOPMENTS IN INFINITE DIMENSIONAL HOLOMORPHY

BY LEOPOLDO NACHBIN

1. **Introduction.** There has been a recent and growing interest in holomorphy in infinite dimensional spaces; that is, the study of holomorphic mappings on open, or compact, or more general subsets of complex Banach spaces, or even of complex topological vector spaces which are locally convex, as well as of manifolds modeled after such spaces. This is an area of convergent attention of present day analysts and geometers.

Actually, such a field of research has old roots in the past. They stem from the investigation of holomorphic mappings in infinitely many variables and from the consideration of Taylor series-like expansions of functionals, discussed during the final quarter of the last century and the first quarter of this century. I refer you to the expositions in monograph form by Volterra, Pincherle, Paul Lévy and Hille-Phillips, for instance.

There is a huge literature on the subject covering the old-fashioned, the classical and the recent periods of the creation of this theory. An interesting historical survey has been made recently by Angus Taylor.

In this one-hour lecture, I shall try to describe some current progress, part of which is as yet unpublished. In so doing and by reason of limitation of time, I must be choosy. Needless to say, I will today confine myself to results which are closer to my heart.

2. **Holomorphic mappings.** Let me start with some notation and terminology.

E and F will denote complex topological vector spaces which are locally convex. During most of this lecture, you can think of E and F as just being in particular Banach spaces.

Passing from the finite dimensional situation to Banach spaces presents us with challenging problems. Passing from Banach spaces to locally convex spaces leads us to new challenges.

U will denote a nonvoid open subset of E. K will be a compact subset of E.

$\mathscr{L}_s(^mE;F)$ will denote the vector space of all continuous symmetric m-linear mappings $A:E^m \to F$, where E^m is the Cartesian m-power of E.

If $A \in \mathscr{L}_s(^mE;F)$ and $x \in E$, I will write

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