Birkhoff's earlier work in the asymptotic theory of ordinary differential equations, as well as in consequence of certain considerations of mathematical physics, the truth of this conjecture would offhand appear as rather likely. This fact explains the purpose of the present work—taking a purely mathematical point of view, the author considers linear partial differential equations containing a parameter λ and first establishes existence of formal solutions containing those of Birkhoff as a special case. He then establishes (for second order equations) some general existence theorems, asserting existence of 'actual' solutions, which are functions asymptotic to the formal series. This theory is naturally divided into two parts—one relating to equations of elliptic type, the other referring to those of hyperbolic type. Equations of parabolic type have not been considered in the present work. (Received November 24, 1941.)

61. S. M. Ulam: *A geometrical approach to the theory of representations of topological groups.* Preliminary report.

The theorem of von Neumann on the representations of compact groups by sequences of finite matrices is proved by consideration of geometrical properties of compact convex bodies in the space of continuous (real-valued) functions on a compact space. (The use of Haar measure is avoided.) A number of related results are derived. (Received November 25, 1941.)

62. František Wolf: *On majorants of analytic functions.*

If $f(z)$ is analytic in $|x|<a, |y|<b$ and $|f(z)| \leqq M(x)$ where $\int_{-a}^{a}\log^+\log^+ M(x)dx < \infty$, then to an arbitrary $\delta>0$ corresponds a ϕ, dependent only on $M(x)$ and δ, but independent on the particular $f(z)$, such that $|f(z)| \leqq \phi$ for $|x|<a-\delta$, $|y|<b-\delta$. This is a generalization of a result of N. Levinson (*Gap and Density Theorems*, p. 127, Theorem XLIII). The theorem is proved by a method used by the author to prove a generalization of Phragmén-Lindelöf theorem (Journal of the London Mathematical Society, vol. 14 (1939), p. 208) which becomes a corollary of the above theorem. Another corollary is Nils Sjögren's result (Congrès des Mathématiques Scandinaves à Helsinfors, 1938): If $f(z)$ is analytic in the unit circle and such that $|f(z)| \leqq M(\arg z)$ for $1-\epsilon<r<1$ and $\int_0^{2\pi}\log^+\log^+ M(\theta)\cdot d\theta<\infty$, then $|f(z)| \leqq \phi$ in $|z| \leqq 1-\delta<1$. ϕ does not depend on the particular $f(z)$, but only on $M(\theta)$ and δ. (Received October 25, 1941.)

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63. A. E. Engelbrecht: *Circular plates with large deflections.*

The nonlinear system of equations derived by von Kármán is used to obtain a solution for a family of thin circular plates involving radial symmetry and having a uniform moment applied at the periphery. The edge of the plate to which the external moment is applied suffers no displacement normal to the plane of the plate, but is free to move laterally. The solution is effected by expanding the deflection w and the stress function ϕ in terms of a small parameter $\epsilon = h/a$ where h is the plate thickness and a the radius of the plate. By this expansion the nonlinear system reduces to an iterative process for determining the successive terms. Satisfactory numerical results are obtained for the deflection, bending moments and direct planar stresses for plates whose maximum deflection is twice the order of the plate thickness. (Received October 21, 1941.)