## ANALYSIS

### 179. R. P. Agnew: *A family of bounded sequences summable M.*

A simple example is given of a family of bounded sequences, summable $M$, which is not a separable subset of the space $B$ of bounded sequences. (Received May 2, 1944.)

### 180. R. P. Agnew: *Convergence fields of methods of summability.*

Let $A$ be a multiplicative matrix method of summatibility with multiplier $\rho$. If $\rho=0$, each sequence $x_n$ which oscillates sufficiently slowly is summable $A$ to 0. If $\rho\neq 0$ and $x_n$ is summable $A$ to $L$, then the sequence $(x_n-L/\rho)\xi_n$ is summable $A$ to 0 if the sequence $\xi_n$ oscillates sufficiently slowly. (Received May 16, 1944.)

### 181. I. S. Reed: *On the solution of a general transform.*

The purpose of this paper is to give a brief extension to the solution of a Watson transform with an unsymmetrical kernel. Use has been made of the work that has been done by Hardy, Watson, Titchmarsh, Goodspeed, and others. (Received April 26, 1944.)

### 182. Tibor Rado: *On the Geöcze area of Fréchet surfaces.* Preliminary report.

The Geöcze area of a surface $S$ is defined in terms of projections upon the coordinate planes. Perfecting previous theories originating with the work of Geöcze, Reichelderfer (Trans. Amer. Math. Soc. vol. 53 (1943) pp. 251–291) introduced and studied an *essential area*. In his definition (loc. cit. p. 274) we replace *simple Jordan regions* by *domains of any connectivity*, and obtain an area to be denoted by $G(S)$, where $S$ stands for a Fréchet surface of the type of the sphere or the disc. In this paper we develop a comprehensive theory of $G(S)$ as a foundation for the theory of the area. One of the results states that if the Lebesgue area $L(S)$ is finite, then $G(S)=L(S)$. Essential use is made of methods and results developed in recent years by Reichelderfer, Morrey, Youngs, and the author. (Received April 19, 1944.)

### 183. A. R. Schweitzer: *On functional equations with solutions containing arbitrary functions.* VI.

The author constructs equations in iterative compositions satisfied by specific functions of variables and derived from conditions of invariance of iterative compositions of these functions under substitution groups on the variables of the latter. For example, functional equations satisfied by arbitrary functions of the type $\gamma(x_1+x_2+\cdots+x_n)$ are obtained by assuming that the function $\beta\{\alpha(x_1+x_2+\cdots+x_m)+\alpha(y_1+y_2+\cdots+y_m)+\cdots+\alpha(t_1+t_2+\cdots+t_m)\}$ corresponds to a set of imprimitive systems of a given imprimitive substitution group $G_S$ on the variables $x_i, y_i, \cdots, t_i$ $(i=1, 2, \cdots, m)$. These equations express invariance (in the sense indicated) under $G_S$ of the corresponding functional composition $\phi\{f(x_1, x_2, \cdots, x_m), f(y_1, y_2, \cdots, y_m), \cdots, f(t_1, t_2, \cdots, t_m)\}$. A set of functional equations of the preceding type corresponds to any abstract group $G$ with subgroup $H$, since $G$ can be represented as a (regular) substitution group $G_S$ simply isomorphic to $G$ and such that $G_S$ is imprimitive with set of imprimitive systems corresponding to $H$. Functional equations are also constructed when the arbitrary function $\beta$ has as arguments functions whose variables are not necessarily equal in number. (Received May 29, 1944.)