25. S. E. Warschawski: *On the modulus of continuity of the mapping function at the boundary in conformal mapping.*

The author proves the following theorem: Let D be a simply connected region such that (i) D contains the unit circle and is contained in $|w|<R$; (ii) if D is divided into two parts by a crosscut of diameter $\delta<1$, then the diameter d of the subregion of D which does not contain the origin satisfies the inequality $d \leqq \mu\delta+\eta$ (μ and η are constants, $\mu \geqq 1$, $\eta \geqq 0$). Suppose that $w=f(z)$ maps $|z|<1$ conformally onto D ($f(0)=0$, $f'(0)>0$). Let k be an arbitrary constant, $k \geqq 4R^2$, $k>\mu^2$. If z_0 is any point on $|z|=1$ and if z_1 and z_2 are in $|z|<1$ with $|z_i-z_0| \leqq r \leqq \exp\left[-k\pi^2/4\right]$, then $|f(z_1)-f(z_2)| \leqq (kr^\alpha/\mu)+\eta k^{1/2}/(k^{1/2}-\mu)$ where $\alpha=(2/(\pi^2 k))(\log k-2\log\mu)$. This result is applied to the following problem. Let C_1 and C_2 be closed Jordan curves containing $w=0$ in their interiors D_i, such that C_2 is in the ϵ-neighborhood of C_1 (that is, every point of C_2 is within a circle of radius ϵ about some point of C_1) and C_2 in the ϵ-neighborhood of C_1. Let $w=f_i(z)$ map $|z|<1$ onto D_i ($f_i(0)=0$, $f_i'(0)>0$). Then a function $\Phi(\epsilon)$ is determined, which, aside from ϵ, depends only on certain parameters characterizing the C_i, such that $|f_1(z)-f_2(z)| \leqq \Phi(\epsilon)$ for $|z| \leqq 1$. (Received October 19, 1945.)

26. J. W. T. Youngs: *Various definitions of surface and area.* Preliminary report.

This paper lists several definitions of the word "surface" and uses recent results in the field to show how the term "area" can be applied to each. The principal result is that in each case the area is a lower semi-continuous function of the surface. (Received October 17, 1945.)

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27. Edward Kasner and John DeCicco: *Heat surfaces.*

If a region of space is heated by conduction, the temperature v at a time t at a point (x, y, z) is $v=\phi(x, y, z, t)$, where ϕ satisfies the Fourier heat equation. Kasner has introduced the term heat surfaces for those along which v=const. and t=const. In general, there are ∞^2 heat surfaces. In the present work, the authors extend to space certain theorems of Kasner concerning heat families in the plane, published in 1932–1933, Proc. Nat. Acad. Sci. U.S.A. There are no systems of ∞^2 planes or ∞^2 spheres which form a heat family except in the imaginary domain. The only sets of ∞^1 planes which form a heat family are the pencils. A system of ∞^1 spheres is a heat family if and only if it is a concentric set. The only isothermal systems of planes are pencils and the only isothermal sets of spheres are concentric families. The cases where there are only ∞^1 heat surfaces are connected with the equations of Laplace, Poisson, and Helmholtz-Pockels. Finally, these results are extended to n dimensions. (Received October 11, 1945.)

28. H. E. Salzer: *Coefficients for repeated integration with central differences.*

The present paper is aimed toward facilitating double or k-fold repeated quadrature of a function which is tabulated at a uniform interval, with its central differences of even order (see Abstract 51-9-172). When the Everett interpolation formula is integrated k times over an interval of tabulation, one obtains a formula for stepwise multiple quadrature in the form (1) $\int_{x_0}^{x_1}\cdots\int_{x_0}^{x}\int_{x_0}^{x} f(x)(dx)^k = h^k[A_0^{(k)}f_0+B_0^{(k)}f_1$