the sum of all C's containing α_1 as argument, and so on; $\sum(\lambda_1)$ is the sum of all C's not containing α_1, and so on. Then $C(\ )=\sum(\lambda_1\lambda_2\cdots\lambda_{n+1})$, $C(\alpha_1)=\sum(\alpha_1\lambda_2\cdots\lambda_{n+1})$ and so on. The C's are replaced by their corresponding expressions in terms of $\sum$ and the subsequent development follows that of an earlier paper reported in this Bulletin (abstract 47-9-430). The preceding provides a representation R_n for the latter exposition; R_2 is equivalent to the so-called Euler diagram which in turn is topologically equivalent to the figure of a triangle in a descriptive plane extended in accordance with the author's system ${}^2K_2$ (ibid., p. 395, Axiom 12). R_2 is topologically equivalent to the figure of a trifoliate curve inscribed in a circle. Another basis for the algebra of logic in the author's theory is found in a simple modification of his axioms for a linear "permutation" (ibid., p. 370). (Received November 24, 1941.)

Statistics and Probability

88. R. D. Gordon: *An application of the Cauchy integral to a problem in probability theory.*

The author was consulted about interpretations of certain data on biological populations. The problem aims at obtaining error corrections on the data. The classical basis of the Bayes-Laplace formula is chosen: $(x)(n/x)=(n)(x/n)$ where the notation has the usual meaning in probability theory. The probability (n/x) is known through its generating function. The distribution (x) of the parameter x, an integer, is taken on reasonable grounds to be $(x)=1/b+1$, for $0\leqq x\leqq b$; $(x)=0$ otherwise. Then $(n)=\sum(x)(n/x)$ is determined. An "observation" results in a value n_0 of the stochastic variable n. The problem: to determine the distribution $(n/n_0)=\sum(n/x)(x/n_0)$. We actually obtain the generating function for the *moments* of (n/n_0). Simple manipulations result in the Cauchy-integral equation $(x)G_{(n/x)}(t;\ x)=1/2\pi i\int_{(\Gamma)}G_{(n)}(t/s)\cdot E(s;x)ds/s$ where the G's represent generating functions for the probability distributions indicated in their subscripts, and $E(s;\ x)$ represents an *unknown* generating function for probabilities (x/n) *with respect to n*. The problem is solved by applying standard generating-function operators to this equation and integrating over the circle $|s|=t$. (Received November 14, 1941.)

89. G. F. McEwen: *On the probability that a ratio of random numbers will depart from a harmonic ratio by less than a given amount.*

The ratio of two numbers is called harmonic if it equals the ratio of two small integers, one figure numbers, for example. In practical applications both numerator and denominator are subject to error and their ratio accordingly departs from perfect harmony. Accordingly, it is necessary to estimate the probability P of getting by chance a ratio departing less than a given amount from perfect harmony. This problem of determining the proportion, among all possible combinations of numbers, that have a ratio departing from perfect harmony less than this amount, is equivalent to that of finding the probability P that the ratio of any two numbers drawn at random will depart by an amount X or less from the harmonic ratio N/M. The solution is $P=2(M^2/N)X/[1-(M/N)^2X^2]$, where $N>M$. (Received October 27, 1941.)

Topology

90. W. W. Flexner: *Noncommutative chains.* II. Preliminary report.

Extending the author's recent work (Duke Mathematical Journal, vol. 8 (1941), pp. 497–505) to a finite convex 3-complex, 2-dimensional noncommutative chains and