If planes are passed through a polyhedron in such a way as to permit removing parts and leaving cells which are joined along their edges, and adjoining cells are bounded by one or more planes which are common to the two cells, then one-sided polyhedra can be derived. In this paper the method is applied to the five regular solids and several forms are shown constructed of plastic material. The intersecting planes may be so disposed as to cut away the vertices, the edges in whole or in part, and parts of the faces of the original solids. In particular, in the case of the regular icosahedron, a part of a regular dodecahedron of the second species may be removed from the interior of the solid leaving a group of cells distributed along the edges of the original solid, and the cells can be entered or traversed in more than one way. Two types of one-sided octahedra are shown. (Received May 26, 1944.)

194. Oscar Zariski: *The theorem of Bertini concerning the variable singular points of a linear system of varieties.*

If the ground field k of an algebraic irreducible r-dimensional variety V/k is extended by the adjunction of indeterminates $u_1, u_2, \cdots, u_m$, we denote by V/K the extended variety over $K=k(u)$ which has the same general point (ξ) as V/k. Each subvariety W/k of V/k has similarly a unique extension W/K on V/K, and each subvariety W^*/K of V/K has a unique contraction W/k on V/k. Given $m+1$ linearly independent polynomials $f_i(\xi)$, $i=0, 1, \cdots, m$, there is a unique $(r-1)$-dimensional irreducible subvariety F^*/K of V/K whose general point (η) satisfies the equation $f_0(\eta)+u_1f_1(\eta)+ \cdots +u_mf_m(\eta)=0$. The main result is as follows: (1) W/k is a base variety of the linear system $|F|$ defined on V/k by $f_0+\lambda_1f_1+ \cdots +\lambda_mf_m=0$, if and only if W/K is on F^*/K; (2) if W^*/K is a singular subvariety of F^*/K, then the contraction W/k is either singular for V/k or is a base variety of $|F|$. The theorem of Bertini *in its classical formulation* ("the variable singular points of $|F|$ are either singular for V/k, or lie on the base locus of $|F|$") is equivalent to (2), if k is of characteristic zero, and is false if k is of characteristic $p\neq 0$. (Received April 6, 1944.)

Topology

195. W. H. Gottschalk: *Orbit-closure decompositions and almost periodic properties.*

Let X be a metric space with metric ρ, let $f(X)\subset X$ be a continuous mapping, and let $h(X)=X$ be a homeomorphism. For $x\in X$, the set $\sum_{n=0}^{+\infty} f^n(x)$ is called the *semi-orbit* of x under f and the set $n\sum_{-\infty}^{+\infty} h^n(x)$ is called the *orbit* of x under h. The mapping f is said to be *pointwise almost periodic* provided that if $x\in X$, then to each $\epsilon>0$ there corresponds a positive integer N with the property that in every set of N consecutive positive integers appears an integer n so that $\rho(x, f^n(x))<\epsilon$. The mapping f is said to be *uniformly pointwise almost periodic* provided that to each $\epsilon>0$ there corresponds a positive integer N such that if $x\in X$, then in every set of N consecutive positive integers appears an integer n so that $\rho(x, f^n(x))<\epsilon$. The following theorems are proved: In order that the mapping f (homeomorphism h) give a semi-orbit-closure (orbit-closure) decomposition of X it is sufficient that f (h) be pointwise almost periodic; and in case X is locally compact (compact), this condition is also necessary. In order that the mapping f (homeomorphism h) give a continuous semi-orbit-closure (orbit-closure) decomposition of X it is sufficient that f (h) be uniformly pointwise almost periodic; and in case X is compact, this condition is also necessary. (Received May 15, 1944.)