is expressible as the product of a finite number of mutually co-prime, prime quanta. In section 2 we give examples to ensure the existence of notions introduced in section 1, and of course to justify their introduction. Section 3, establishes analogues of some results about UFD's, while in section 4, we study the stability properties of the GUFD's. In section 5, we study the ideal theory of GUFD's and related integral domains and at the end of this section we prove that if a proper ideal A in a Prüfer domain R has a primary decomposition then this decomposition is unique.

1. Definition and properties of Prime quanta.

We split our task of defining a <u>prime quantum</u> into two parts, that is we give the generalization of the concept of atom first and state the

Definition 1. A non zero non unit element h in an integral domain R will be called a <u>quantum</u> if for each non unit $h_1 | h$ there exists a positive integer n such that $h | h_1^n$.

We note that the semigroup $R^* = R - \{0\}$ is preordered by $a|b$ (divisibility) and if U is the set of all the units of R then the semigroup R^*/U is partially ordered by $aU < bU$ iff $a|b$, and obviously by <u>h is a quantum</u> we mean that for every $U \neq h_1U < hU$ there exists a positive integer n such that $hU < h^nU$. In view of the partial order we may call a quantum h_2 higher than another quantum h_1 if $h_1U < h_2U$.

Definition 2. If in an integral domain R a quantum h divides an element a such that there exists no other quantum h_1 with $hU < h_1U < aU$, then h will be said to divide a <u>completely</u>.

Now to make a quantum behave more like a prime power we impose some more conditions on it by