in semen from vasectomized rams were extremely low: acid phosphatase activity was <1% of the total activity of normal semen. Thus the bulk of 'soluble' enzymes recovered in the plasma presumably diffused from organelles (e.g. droplets and acrosomes).

We conclude that the acrosome is a specialized lysosome that has evolved to facilitate fertilization in multi-cellular organisms.

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Distribution and Behaviour of some Glycolytic Enzymes in Spermatozoa and Cytoplasmic Droplets from Mammalian Semen

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Semen from the bull, boar and ram normally contains, in addition to spermatozoa, small spherical particles 2–3 μ in diameter known as cytoplasmic droplets (Dott & Dingle, 1968). It is difficult to obtain a preparation of droplets essentially free of spermatozoa or a preparation of spermatozoa essentially free of droplets. One method for preparing droplets has been published (Dott & Dingle, 1968).

Another method has been developed whereby a single sample of semen can be separated easily into populations of droplets and spermatozoa, each preparation containing less than 5% contamination of the other particle. This method involves slow cooling and storage at 4° in a milk diluent, followed by slow differential centrifugation and washing in a sucrose medium.

Analysis of hexokinase, glucose phosphate isomerase and lactate dehydrogenase activities in our preparations revealed certain intrinsic differences in enzyme distribution between the spermatozoa and droplets: in particular, although both spermatozoon and droplet contain very large amounts of glucose phosphate isomerase (the amount per particle is approximately equal), the droplet contains less than one-tenth the amount of lactate dehydrogenase activity that is found in

the spermatozoon. Hexokinase is partly bound in each type of particle, glucose phosphate isomerase is entirely soluble, but lactate dehydrogenase is partly bound in the spermatozoon and soluble in the droplet.

Because of the great practical importance of storage of deep-frozen semen for artificial insemination, much research has been done on the mortality of spermatozoa when deep-frozen or cold-shocked, and emphasis has been placed on the leakage of enzymes from the spermatozoon during these treatments (Murdoch & White, 1968). We therefore cold-shocked, deep-frozen, and shocked hypo-osmotically our preparations and studied the leakage of enzymes by using glucose phosphate isomerase and lactate dehydrogenase as differential markers. The results show that the droplet preparations are very susceptible to all of the treatments, particularly cold-shock and deep-freezing, and leakage of enzymes occurs readily under these conditions. In all cases, although leakage from spermatozoa occurred, the droplets were more fragile and a much greater percentage of their total enzyme content leaked out.

Thus it seems that when enzyme analyses are carried out on seminal constituents, care must be taken to differentiate between the contribution from the droplets and the contribution from the spermatozoa.

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An Electron - Microscope - Autoradiographic Investigation of the Localization of ²⁴¹Pu in Rat Liver

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The intracellular sites of storage in the liver of various colloidal metals have been investigated as a result of the interest in 'bone-seeking' elements (Langham, 1959; Taylor, 1964). Plutonium has been shown to remain in the liver for several months (Taylor, Sowby & Kember, 1961). The reports from biochemical investigations of cell fractions have been conflicting as regards the association of injected plutonium with lysosomes. Rahman & Lindenbaum (1964) demonstrated a close relationship between lysosomal enzymes and cytoplasmic vacuoles containing segregated polymeric ²³⁴Pu in rat liver. Taylor and associates partially confirmed these findings but proposed in addition that mitochondria may also be sites of