

of  $\text{MgHPO}_4^-$ , or free  $\text{Mg}^{2+}$ , a relatively large amount of back reaction occurred. Thus the phosphoenzyme intermediate appears to be formed simultaneously from ATP as well as  $\text{P}_i$  under the conditions for maximal ATP cleavage. The lack of  $\text{P}_i \rightleftharpoons \text{ATP}$  and  $\text{ATP} \rightleftharpoons \text{HOH}$  exchanges emphasize the apparent irreversibility of the overall reaction in vitro.

The  $\text{P}_i \rightleftharpoons \text{HOH}$  exchange occurring during ATP cleavage was linear with time and showed no lag period, similar to results obtained with myosin and heavy meromyosin by Swanson, Yount and Hermann (7,30). Dempsey and Boyer (5,25) and Sartorelli et al. (28) have observed a lag period, however, suggesting induction of conformational changes prior to appearance of the exchange. It is of interest that neither the soluble nor the membrane-bound  $\text{Mg}^{2+}$ -ATPase of Streptococcus faecalis catalyzes a medium or ATP-induced medium exchange (68), perhaps reflecting the totally uncoupled state of the enzyme.

Under proper conditions the incubation of microsomal fractions from brain and kidney with deoxycholate gives rise to increases in specific activity of the  $(\text{Na}^+, \text{K}^+)\text{-ATPase}$  whereas the basal  $\text{Mg}^{2+}$ -ATPase remains unchanged or decreases (1). Skou (69) has interpreted activation of the  $(\text{Na}^+, \text{K}^+)\text{-ATPase}$  as being due to exposure of latent sites in the membrane since the molecular activity remains constant. Similar marked increases in activity were observed with the porcine outer medullar enzyme employed in this study, whereas no activation of ATPase activity was observed upon similar treatment of the electroplax enzyme.

In distinct contrast to the effect of deoxycholate on the rate of ATP cleavage, however, the medium exchange was surprisingly sensitive to the detergent. These findings may be related to the observations of