coeliac patients by using Leu-Pro, Phe-Pro and Glu-Pro, the zymograms were almost identical. These present results and the findings of others (Lindberg, Norden & Joseffson, 1968; Douglas & Booth, 1969) strongly suggest that the decreased activities of some peptidases in untreated coeliac intestine may be due to secondary phenomena attributable to the abnormal morphology of the mucosa.

To obtain more specific information about the intestinal hydrolysis of gluten, ^{125}I -labelled gliadin peptides were used to study intestinal peptidases. Results will be presented on the suitability of these peptides as substrates for intestinal peptidases.

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Multiple Forms of Pig Intestinal β -Galactosidase and Related Activities

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Studies on humans (Hsia, Makler, Semenza & Prader, 1966; Gray & Santiago, 1969), rats (Asp & Dahlqvist, 1968) and a number of other species indicate that intestinal β -galactosidases fall into two main groups. 'Acid' β -galactosidases have low pH optima, are readily solubilized, work best on hetero galactosides and are inhibited by *p*-chloromercuribenzoate. 'Neutral' β -galactosidases are essentially disaccharidases with neutral pH optimum that are associated with brush-border particles. They are not readily inhibited by *p*-chloromercuribenzoate. Multiple forms may occur within these groups and the substrate specificity may include glycosides with a β -glucosidic configuration.

We have examined pig intestinal mucosa and compared its enzymes with those described in pig kidney by Abrahams & Robinson (1969). Four enzymes with activity towards 4-methylumbelliferyl β -D-galactoside can be separated on DEAE-cellulose at pH 6.5 in 10mm-phosphate buffer by using a NaCl gradient. Form I is unretained by the columns; forms II, III and IV are eluted successively with increasing salt concentration. Form I has narrow specificity in requiring the galactose configuration at C-4, but hydrolyses hetero glyco-

sides (β -galactosides and α -arabinosides) as well as lactose. Forms II and III have identical specificities, hydrolysing β -glucosides and β -galactosides and the corresponding pentosides, but have no effect on lactose. Form IV has hexosidase but no pentosidase activity, and it is most effective on lactose. Unlike forms I, II and III it is not readily inhibited by *p*-chloromercuribenzoate and closely resembles the 'neutral' lactases previously reported. On starch gel electrophoresis at pH 6.8, form I remained at the origin, forms III and IV migrated rapidly towards the anode at the same rate, and form II showed intermediate mobility. Forms III and IV could be resolved electrophoretically on thin agarose gels. At pH 5.0 form I is dissociated into two bands migrating in opposite directions but retaining β -galactosidase activity. The two forms of soluble β -glucosidase reported by Abrahams & Robinson (1969) in pig kidney have the same substrate specificities and electrophoretic mobility as forms II and III reported here.

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Isoenzymes in the Study of Wild Populations

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The superior resolution of starch-gel electrophoresis in the separation of proteins has added a new dimension to studies in genetics. This technique has enabled us to examine variation at the molecular level. It has been shown that normal body proteins are polymorphic and that the actual molecular variants present are genetically determined. Thus with the aid of this biochemical technique it is now possible to detect and analyse the action of both directed and stabilizing selection in natural populations at the molecular level.

In the present study samples from a wild population of the house mouse, *Mus musculus*, living on the small island Skokholm off the coast of Pembrokeshire in South Wales (Berry, 1968) were surveyed at six loci. Gene frequencies were computed at the beginning and end of the breeding