P.S. In his memoir, Norm Horowitz omits the Edinburgh paper, in the list of Beadle's works.

16 Rodger Avenue
Leabrook
S. Aust. 5068
12.XII.1990.

Dear Lederberg,

I have been reading your biography of Ed Tatum in Biographical Memoirs 59 with great interest and would like to comment on the section "anticipating the one gene-one enzyme theory". There is good evidence that Beadle knew of Garrod's work before 1939, perhaps when he was in Harvard. At the ill-fated 7th International Genetics Congress in Edinburgh in 1939, Beadle gave a paper "Genetic Control of the production and utilization of hormones" & the text is in full as no. 19 of the Proceedings, published January 1941; the pages are 58-62. In it he refers to Garrod on alcaptonuria and cites the work in the bibliography; he must have seen it previously.

Actually, it could be argued that Bateson initiated the theory that genes acted by determining enzymes. In "Mendel's Principles of Heredity" (1909), after describing Garrod's work, Bateson pointed out the general similarities between gene action and the action of ferments (as enzymes were then called). Later in the book, Bateson, in conclusion, wrote "in at least a large group of cases the heredity of characters consists in the transmission of the power to produce something with properties resembling those of ferments. It is scarcely necessary to emphasise the fact that the ferment itself must not be declared to be the factor or thing transmitted, but rather, the power to produce that ferment, or ferment-like body." Bateson thought that perhaps not all genes determined an enzyme, for how could an enzymic action result in, say, brachydactyly, with the loss of a phalanx? Sturtevant, in his History, summarises Bateson's views.

Subsequent work, e.g. on flower pigments, sought suitable material to extend the work, as human abnormalities were scarce. Fortunately, B. & T. found & exploited the most satisfactory material. I think that, at Edinburgh, some of us discussed the use of fungi with Beadle, but international events halted more detailed thought.

With kind regards, yours David Catcheside.