The turbidity-reducing phenomenon also throws light on the nature of the interaction between viral enzymes and their mucoprotein substrates. Gottschalk and his collaborators[10] have shown that an N-substituted fructosamine (*iso*glucosamine) is liberated as an end-product of the interaction between influenza virus and partly purified mucoprotein substrates. The turbidity-reducing action of *MEL* and *WS* viruses suggests that, as with hyaluronidase, the initial attack on the substrate is a depolymerization which precedes the liberation of substances reacting with Ehrlich's reagent. Finally, the turbidity-reducing reaction provides truly *in vitro* evidence of the reality of enzymic action by influenza virus.

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Hæmagglutinin Anti-*N* in Plant Seeds

Some plant seeds contain specific antibodies for the antigens *A*, *B* and *O* (or *H*) of human blood[1,2]. *Rh*, *M* and *N* antibodies have been sought, but with negative results[2]. Through the courtesy of Prof. K. Mohrdiek (Porto Alegre), we received seeds of four species of *Vicia* from southern Brazil. Seed extracts were made and tested in the usual manner[1], except that the blood cells were washed once and readings made with a hand lens. The seeds of one species were found to contain anti-*N*.

The freshly prepared extract of *Vicia graminea* agglutinated *N* or *MN* cells, the titre being 32 to 64 after one hour at 4°, 20° or 37° C. The extract diluted 1 : 4 left as a rule suspensions of *N* cells unaltered after one hour, although some *M* samples did react. The same dilution of the extract agglutinated after half an hour, of a total of twenty-five samples, all the twelve *N*-positive and none of the thirteen *N*-negative ones. This would demonstrate that the antibody of the extract is anti-*N* if we were dealing with an independent antigen – antibody system. Generally, however, *N* occurs more often with *s* than with *S*. To exclude anti-*s* we made use of anti-*S*, since we had no anti-*s*; and some *S*-negative, hence *s*-positive, samples gave negative reactions with the extract 1 : 4 after half an hour. Under the same conditions eighty-three random blood samples were examined, fifty-seven of which gave positive and twenty-six (or 31 per cent) negative reactions with the extract, in agreement with the frequency (30·6 per cent) of type *M* in São Paulo[3,4]. Among those eighty-three reactions only one was doubtful, and the respective sample was shown to be *MN* with unusually weak *N*. In conclusion, the extract of *Vicia graminea* contains *N* antibody of an activity and specificity not much inferior to those of the animal anti-*N* sera in use.

As to the other seeds, the extract of *Vicia linearifolia* failed to agglutinate human blood even after three hours. In the seeds of *Vicia sativa* and *Vicia benghalensis* strong agglutinins were present but without distinct specificity for *A*, *B*, *O*, *M*, *N*, *S*, *P*, *C*, *D*, *E*, *c*, *d*, *e*, *Lu*, *Le*^{a}, *K* or *Fy*^{a}.

Yet, since one among four species of *Vicia* displayed specific hæmagglutinin not related to the *ABO* system, it seems probable that the screening of such extracts with a large panel of blood cells might lead to the discovery of more specimens of *N* antibody and even of hæmagglutinins of other specificity.

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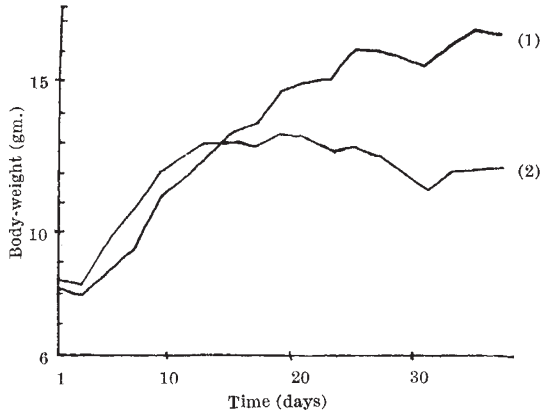
Orotic Acid as One of the Growth-factors of Mice

In 1946 it was shown in our laboratory[1] that orotic acid causes an increase in the reticulocytes in circulating blood, but its action in increasing the body-weight of albino rats by administering orotic acid to animals fed on a basic diet was not made clear. This was attributed to the fact that the basic ration was inadequate. Three years ago we conducted feeding experiments, again with mice instead of rats, and confirmed the growth-promoting action of this acid. This time the experiment was conducted as follows. The basic ration was composed of rice starch 0·6 gm., casein 0·2 gm., lard 0·15 gm., McCollum salt 0·05 gm. Moreover, each animal was given 0·1 gm. of yeast dry powder and two drops of cod liver oil daily. Rice starch was prepared from the polished rice, which was further freed from its embryos by means of hand. Seven litters weighing 7–7·5 gm. born of the same dam were used. Four of them were fed with 5 mgm. of orotic acid daily besides the basic diet; the remaining three were kept on the basic diet only as controls. Until the eleventh day from the beginning of the



Mean values of body-weight of mice: (1) fed with orotic acid; (2) controls