

cent. solution of sodium carbonate; other conditions as before; time 18 hours:

	Undigested fibrin.	Per cent. digested.
Papoid.....	.37 grm.	63 per cent.
Pancreatin.....	.02 "	98 "

EXPERIMENT V.—Papoid in .2 per cent. solution of sodium carbonate and pancreatin in a 1 per cent. solution; other conditions as in Experiment I; time 20 hours:

	Undigested fibrin.	Per cent. digested.
Papoid.....	.131 grm.	86.9 per cent.
Pancreatin.....	.122 "	87.8 "

EXPERIMENT VI.—In order to determine the conditions under which papoid is most active, its action on 1 grm. of fibrin in the presence of different quantities of alkali was estimated with the following result; time 18 hours:

	Undigested fibrin.	Per cent. digested.
Papoid + 1 per ct. Na ₂ CO ₃44 grm.	56 per cent.
+ 5 ".....	.28 "	72 "
+ 2 ".....	.12 "	88 "
in neutral solution.....	.18 "	82 "
In 3 p.c. hydrochloric acid....	.96 "	4 "

EXPERIMENT VII.—The action of papoid in neutral solution on diphtheritic membrane compared with that of pepsin:

(a) Papoid digested completely .3 grm. of diphtheritic membrane in 20 hours.

Pepsin had only partially dissolved the same weight of membrane at the end of 36 hours.

(b) Papoid dissolved completely 5 grm. of membrane in 23-24 hours.

In these experiments a 5 per cent. solution of papoid or of pepsin was added to the undivided membrane, and the whole kept wet during the time specified. The membrane was reduced to a clear fluid jelly by papoid, but only partially attacked by the pepsin under the same conditions.

EXPERIMENT VIII.—Does acid destroy the proteolytic action of papoid as it does that of trypsin?

To ascertain this, .2 grm. of papoid was added to 1 gramme of fibrin in a .3 per cent. solution of hydrochloric acid in duplicate. Both mixtures were made up to 50 cc. and left in the incubator for three hours. At that time one mixture was estimated and the other made faintly alkaline with sodium carbonate and left in the incubator for 13 hours longer. The acid mixture showed no digestion,—no reaction indicating peptones could be obtained. At the end of 13 hours the other mixture gave a residue of .23 grm., showing that 77 per cent. had been digested. The proteolytic ferment of papoid is therefore not destroyed by being kept in an acid medium for three hours at blood heat; its action is only suspended. The conclusions to be drawn from these experiments are obvious. Papoid evidently contains a powerful proteolytic ferment which resembles trypsin both in the conditions under which it is most active and in its mode of digestion. It corrodes the

fibrin, dissolving each piece away from the surface to the centre, does not gelatinize the whole mass like pepsin. Moreover, one can readily obtain leucin in the products of digestion. Trypsin could not be obtained by the writer, but its presence was determined by Dr. Martin, who worked with larger digestion mixtures. Papoid, as shown in Experiment II, is quite inactive in small quantities in an acid medium of .3 per cent. hydrochloric acid. A certain amount—3 to 7 per cent. of the fibrin—was dissolved by it, but no true digestion occurred, as peptones in any quantity were absent. The results of Experiment VIII, however, show that although it is inactive in acid its functions are only suspended, the ferment is not killed. This is interesting, in view of the frequent use of papoid for treatment of dyspepsia. If the stomach be normally acid, its activity will probably be suspended entirely; if, however, the acidity be very slight, papoid will probably act. Its greatest action, however, takes place in the small intestines, where the medium is alkaline or neutral. The ferment is most energetic in a faintly alkaline medium, about .2 per cent. of sodium carbonate.

Comparing its digestive power with that of pepsin and pancreatin, Experiment I shows that in a neutral medium its activity is far greater than pepsin, but it is inferior to it in an acid medium. Under the conditions that have been found to be most favorable to their respective functional activity, papoid is but little, if at all, inferior to either pepsin or pancreatin.

Papoid is especially useful for the removal of diphtheritic membrane. The conditions present in the pharynx are just those which retard the action of pepsin and pancreatin, but do not influence papoid. The medium in which it is required to act is practically a neutral one and the temperature low, there is present, besides, a large excess of the products of digestion which does not affect papoid—indeed it is most energetic in a concentrated medium. Moreover, papoid has been shown clinically to lessen very greatly the disagreeable fetor of the disease. Painting on a 5 per cent. solution, freshly made, every two or three hours has been found to give the best results; the fetor disappears in a few hours and the membrane in from 12-18 hours becomes thin and glairy. It would seem to be especially indicated in those forms of dyspepsia in which peptic digestion is greatly impaired and where the secretion of gastric juice is very weak. Papoid, therefore, promises to be a powerful auxiliary in combating those great diseases—diphtheria and dyspepsia.—R F. Ruttan, M.D., in *Can. Med. and Surg. Jour.*

DR. LAUDER BRUNTON finds that small doses of strychnia are very useful in neurasthenic insomnia.