third 60 cc, and a fourth received 70 cc. These animals exhibited no ill effects from this treatment. Also, extracts of liver and of muscle from postpartum animals were without effect even though extracts of edematous uteri from the same animals were strongly toxic.

Since a postpartum rabbit uterus contains a toxic factor when administered to normal animals, it was considered possible that a postpartum rabbit with its edematous uterus intact would be less susceptible to uterine extracts known to be toxic than would a non-pregnant animal. To this end, extracts of known toxicity were injected into four rabbits, two on the day before delivery, a third on the day of delivery, and the fourth, one day postpartum. Death occurred in all of these after injections of less than 8 cc, indicating that these animals were no less sensitive to the toxic factor than were non-pregnant animals.

The symptoms immediately preceding death in all these animals were strikingly similar to those described in anaphylaxis, although none of the animals used had been previously sensitized. Autopsy of four animals indicated that the pathological changes also were similar to those found after anaphylactic death. The similarity in both symptoms and pathological changes to those of anaphylaxis, and the reported relation between anaphylaxis and histamine suggest a possible explanation for the toxicity of saline extracts of postpartum uteri. Experiments now under way indicate that the presence of large amounts of histamine or a histamine-like substance may be responsible for the toxicity of such extracts.

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THE BIOLOGICAL ACTIVITY OF SYNTHETIC PANTOTHENIC ACID

FOR some time we have been interested in the chick antidermatitis factor content of rice bran filtrate ("Vitab" Type II), which has been demonstrated to be a rich source of this vitamin.[1] In this connection the recently reported determination of structure and synthesis of pantothenic acid by Williams and Major in SCIENCE[2] is of considerable interest. Since a microbiological method for the estimation of this factor is available,[3] rapid methods of assay are at hand to further the chemistry of pantothenic acid, which is regarded as identical with the chick anti-dermatitis component of the B complex.[6] We have synthesized β, β-dimethyl-α-hydroxy butyrolactone, condensed it with β-alanine and measured the activity of the product microbiologically. Representative results are presented in Table 1.

TABLE 1

COMPARATIVE MICROBIOLOGICAL RESULTS BETWEEN "VITAB" TYPE II RICE BRAN FILTRATE AND SYNTHETIC PANTOTHENIC ACID

cu mm rice bran filtrate	cc N/10 acid above blank	cc. diluted sample synthetic pantothenic acid	cc N/10 acid above blank
0.05	1.0	0.5	1.7
0.1	2.2	1.0	2.9
0.15	2.8	1.5	4.1
0.2	3.6	2.0	5.0
0.3	4.7	3.0	6.7
0.5	5.5	5.0	7.4

The crude synthetic product was assayed at a level of 0.28 micrograms per cubic centimeter. This may be compared with the pantothenic acid content of rice bran filtrate ("Vitab" Type II), which is indicated to be 20–27 "filtrate factor units" per gram.[1] This corresponds to approximately 0.4–0.5 milligrams of pantothenic acid per cubic centimeter. Since 0.28 micrograms of the crude synthetic product (1.0 cc diluted sample) stimulated the production of the same amount of acid as 0.15 cu mm of rice bran filtrate supplying .06–.075 micrograms of pantothenic acid, the yield of pantothenic acid was approximately 25 per cent. If the unnatural isomer is inactive, however, the yield was approximately 50 per cent.

On the basis of the above comparative data, it is seen that good agreement was obtained between the expected values for the biological activity of pantothenic acid as supplied by rice bran filtrate and the crude synthetic product. These results agree substantially with those of Woolley,[7] who utilized "partially synthesized" pantothenic acid. In any case it is evident that significant biological activity resulted when our synthetic pantothenic acid was assayed by the microbiological method.

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[3] The microbiological method of assay was made available to us through the courtesy of Dr. R. J. Williams in advance of publication. It is a modification of the Snell and Strong procedure for the estimation of riboflavin (see footnote 4) and was presented at the meetings of the Society of Biological Chemists, New Orleans (see footnote 5).

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