

made of formic, acetic, lactic and succinic acids, ethyl alcohol and carbon dioxide.

The typical delayed fermentation of these sugars shows only slight utilization of the carbohydrate until shortly before acidity develops, when the sugar is suddenly attacked. When the culture is aerated 50 to 75% of the sugar may be utilized in a few days, but when not aerated the population remains at lower levels and much less sugar is used.

Following the enhanced utilization of carbohydrate there is an appreciable increase in the total population, and at this time the rapid variant appears. From this time on both types were observed in the cultures, with the rapid variant predominating during the latter phase of the fermentation.

Flasks inoculated with the rapid variant reached a maximum population, greatest utilization of sugar and the medium was acidified on the first day.

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Isolation of a Herpes Virus from Several Cases of Epidemic Encephalitis.*

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The principal reason that militates against acceptance of the one positive hypothesis of etiology in epidemic encephalitis, namely that it may be due to a neurotropic strain of Herpes virus, is the fact that this easily identifiable virus has been isolated in less than a dozen cases of the disease. The only positive isolations in this country are, so far as we know, those briefly referred to in connection with other work.¹ These first American isolations occurred in 3 successive cases of encephalitis after measles in children. The peculiar conditions explain, we believe, 2 of the reasons why more frequent success has not been obtained by others. In each instance the encephalitis occurred immediately after the exanthem, was clinically charac-

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¹ Gay, F. P., *Infections of the Central Nervous System*, A.R.N. and M.D., 1932, 12, 191, Williams and Wilkins Co., Baltimore.

teristic, and was histologically consistent with a diagnosis of epidemic encephalitis, but suspensions of these human brains failed to kill rabbits on intracerebral injection. Two of these 3 brains did, however, produce an herpetiform skin eruption in rabbits, proved to be due to a true Herpes virus of a strictly dermatropic type by the fact that immunization with each of these brains by intradermal inoculation in rabbits in several, but not in all instances, rendered these animals insusceptible to inoculation with a known Herpes virus. Another reason for failure is indicated by case number 3 in this series which failed on first inoculation to produce even dermal lesions but became active in this regard when the brain had been aged in glycerine for over a month.²

In other words, failure to isolate Herpes virus from encephalitis may be due not only to the scant amount present but also to the fact that an erroneous assumption is made that the virus as obtained from a human case must be neurotropic instead of dermatropic for rabbits.

We have also recently isolated the virus of *Herpes simplex* from 2 acute adult cases of encephalitis which illustrate other reasons for the failure of the majority of observers.

Case 4. A laboratory worker accidentally bitten by a monkey, apparently recovered from the bite, but immediately afterward fell ill of a febrile disease with progressive symptoms of ascending myelitis and died 15 days after the first symptoms of involvement of the central nervous system. The gross and histological picture included areas of softening in the mid brain and widely diffuse areas of perivascular lymphocytic infiltration. The brain of this individual as received was grossly contaminated with a coliform organism but yielded on brain passage through a series of rabbits bacteriologically sterile tissue which killed invariably with characteristic symptoms and which produced an exaggerated skin lesion that was also followed by ascending myelitis and death. The virus present in the brains of these animals was thoroughly identified with known strains of Herpes virus by crossed immunity reactions which will be elsewhere described, and also by producing lethargic encephalitis in Cebus but not in rhesus monkeys.

Case 5 occurred in a male patient aged 27 who had been suffering for 5 years from chronic encephalitis with Parkinsonian syndrome, gyrorotatory spasms of the eye muscles and salivation. Several exacerbations of the acute disease occurred and he was admitted to the hospital in a semi-stupor with a fever of 104° and later fell into

² Perdrau, J., *Brit. J. Exp. Path.*, 1925, **6**, 123.

coma and died on the 11th day after admission. Gross and histological findings of the brain showed hemorrhagic softening of both dentate nuclei and a generalized perivascular infiltration in many parts of the brain and demyelination of the white matter of the cortex. Both areas of softening and perivascular infiltration were noted in the basal ganglia.

These last 2 cases we believe illustrate conditions which must be present but which do not guarantee the findings of a Herpes virus. Brain material, preferably from the region of the basal ganglia, should be used for inoculation; the cases should be in the acute febrile stage, either of the initial acute encephalitis or of an exacerbation of the disease in a chronic case.

We have failed to find Herpes virus in a case of encephalitis following mumps, in another following whooping cough and in another very acute adult case—no one of which differed in any obvious way from these positive cases we have just discussed.

We wish to express our gratitude to Dr. Josephine B. Neal, who has furnished us with the histories and material for all the cases to which reference is made, and to Drs. Orton, Stevenson, and Wolff for the histopathological descriptions.

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Susceptibility of Diabetic Dogs to Tuberculosis.*

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It has been believed for a long time that diabetes predisposes human beings to infections, including tuberculosis, and that when a diabetic individual develops tuberculosis the disease is extremely severe, and rapidly fatal. The incidence of tuberculosis is almost 3 times as great in diabetics as in the general population (Banyai¹). Fitz² found that 63% of his cases died in less than one year (19 of 31 cases). While most writers agree on these findings (Gotten,³

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¹ Banyai, A. L., *Am. Rev. Tub.*, 1931, **24**, 650.

² Fitz, R., *Am. J. Med. Sci.*, 1930, **180**, 192.

³ Gotten, H. B., *Am. Rev. Tub.*, 1931, **24**, 668.