upon other glands, might be interpreted as being primarily due to vascular changes.

Preliminary work on ovariectomized animals shows that the growth potentiality of the clitoris almost disappears after complete removal of the ovaries. There is, however, an indication of a circulatory stimulation. This suggests that at least 2 separate factors are involved. One factor induces congestion and swelling and acts primarily on the clitoris itself; the other factor induces growth and acts secondarily through the stimulation of the ovaries.

The transformation of the clitoris into a penis is not necessarily a specific reaction. Since the clitoris has fundamentally the same morphological structure as the penis, it possesses the potentiality to develop into a penis-like organ, when subjected to a growth stimulus.

Injections of Follutein into male guinea pigs have a comparable effect on the penis. Swelling of the external genital region and increased circulation and swelling of the penis are induced. When the injections are administered into very young males, before the full growth of the penis, pronounced growth effect is noticeable. This effect disappears, apparently, through castration, comparable to the effect in the female after ovariectomy. In the adult normal male guinea pig the growth effect is not apparent but the congestion effect is present.

7306 P

Formation of Agglutinins Within Lymph Nodes.

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Experiments were planned to determine whether or not lymph nodes form antibodies against antigens injected into the peripheral lymphatic capillaries.

On 2 successive days killed cultures of *B. paratyphosus-B* were intradermally injected into the right ear of a large series of mice. The cervical lymph nodes on the right side became much enlarged while those on the left side appeared normal. At varying intervals up to 12 days after the last injection groups of 10 animals were etherized, bled for serum and the lymph nodes which drain the lymphatics of the ears excised. The right nodes were pooled in one

group, the left in another. They were ground with sand, extracted with Ringer's solution and the extracts and serum titrated for agglutinins by 3 methods, the microscopic, the macroscopic and the centrifugation-macroscopic method of Gates.[1]

On the second, third and fifth days after the last injection no agglutinins could be demonstrated in the node extracts or sera; but on the seventh day agglutinins were strongly positive in the extract from the nodes on the injected (right) side at a dilution of 1 in 120. They were questionably positive in the serum at a dilution of 1 in 30. The agglutinin titre was increased in both materials as procured on succeeding days, remaining slightly stronger in the node extract. At length, on the twelfth day, antibodies appeared in the extract from the nodes on the uninjected side.

The results suggested a possible formation of antibody by the nodes. But those on the injected side were inflamed, while those on the other side were not. It was conceivable that the inflamed nodes had merely taken up agglutinin formed elsewhere in the body and brought to them on the blood. There was yet another possibility due to the dilatation of the blood vessels in the ear caused by the injections. As is well known, dilated vessels are more permeable than normal; and it seemed possible that the agglutinins found in the lymph nodes had escaped from the blood vessels into the tissues of the ear and were drained to the nodes by the lymphatics or, further, that agglutinins possibly formed in the ear had been similarly conveyed there. To test these alternatives other experiments were done. Killed cultures of *B. paratyphosus-B* were injected intradermally in the right ears and Schick test toxin in the left. This procedure caused inflammation of the nodes on both sides and dilatation of the blood vessels in both ears. A week later, agglutinins for *B. paratyphosus-B* were found at a dilution of 1 to 240 in the extract from the nodes on the side injected with the organisms. In the serum they were present at a dilution of 1 to 60. None was found in the node extract of the opposite side.

In another type of experiment, the same antigens were injected in the same way into the ears but once only. Three hours later the ears injected with paratyphoid bacterin were cut off. Nine days later, in the node extract from the paratyphoid injected side, agglutinins were found at a 1 to 120 dilution, but none from the extract of the nodes on the other side. The serum gave faintly positive agglutinin reaction at 1 in 60.

Finally 2 agglutinin forming antigens, namely, killed cultures of

[1] Gates, F. L., *J. Exp. Med.*, 1922, **35**, 63.

B. enteritides and of *B. prodigiosus* were injected intradermally in the right and left ears respectively of a series of mice. The injections were made on 2 successive days in some experiments, while in others 5 to 8 injections were given at intervals up to 2 weeks. From one to 3 weeks after the first injection extracts of the pooled right nodes and left nodes were titrated for agglutinins for both of the antigens as was also the pooled serum. Cross agglutination tests were negative. From 4 to 16 times as much agglutinin for *B. enteritides* was found in the node extract from the side injected with that bacterin, as in the extract from the other side; and from 3 to 10 times as much as in the serum. The findings for prodigiosus agglutinin were similar, that is to say, the titre for prodigiosus agglutinin was found far higher in the extract from the nodes of the side injected with *B. prodigiosus,* much less was present in the serum, and still less, or as much as in the serum in the node extract from the opposite side. The lymph glands on the 2 sides were invariably inflamed to about the same extent. The experiment was repeated 4 times with similar results.

The longer the time interval between injection of antigen and examination for antibody, up to 3 weeks, the greater was the concentration of the latter in both serum and nodes. In the experiments in which a single antigen was used, the concentration of antibody in serum and nodes became about equal within three weeks or less but the titre of the serum never exceeded that of the glands.

The findings will be fully reported elsewhere.

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Agglutinin Formation Within the Lymph Nodes of Resistant and Susceptible Mice.

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An accompanying paper has reported the formation of agglutinins within lymph nodes following intradermal injection of killed cultures of bacteria in the ears of mice. Earlier work from this laboratory has shown such intradermal injections to be largely intralymphatic. After injections of killed bacteria into the ear of an animal a cervical lymph node draining the lymphatic capillaries enlarges and a week later agglutinins in high concentration can be found within it. At