

with symptoms of intestinal occlusion. Operation disclosed an obstructing hair-ball in the ileum. Four weeks later symptoms of pyloric stenosis supervened and the material vomited contained hair. Gastrotomy was performed and a hair-ball was found impacted in the pylorus. Recovery ensued.

In both these cases of multiple hair-balls involving the stomach and intestine, the presence of another mass was unsuspected at the first operation. These experiences, together with mine, indicate that a thorough examination of the entire gastro-intestinal tract should be made before closure of the abdomen in every operation for hair-ball.

The other cases reported in the literature are nearly all taken from necropsy records, death having ensued from inanition, perforation or obstruction, the diagnosis being made post mortem. With increasing familiarity with this class of tumors should come an earlier recognition of an operable condition and a steady decrease in such a heavy mortality.

CHOREA

WITH REPORT OF TWO CASES IN WHICH STREPTOCOCCUS VIRIDANS WAS FOUND IN THE BLOOD *

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Ever since Roger in 1866 classed rheumatism, chorea and endocarditis as manifestations of the same pathologic entity there has been much controversy as to the etiology. A review of the literature leaves no doubt that there is a relationship between these diseases. Sturges, Peacock, Owen, Wollenberg, Osler, Hughes, See, Brown, Batton, Meyer, Bright, Garrod, Herringham, Mackenzie and many others have written on this relationship, and have given statistics showing a relationship in from 15 to 80 per cent. of all cases. There are those who conclude that no definite relationship can be established, and at the other extreme there are those who, like Roger, assert that acute rheumatism, chorea and endocarditis are but different manifestations of the same underlying disease. Of late Butler, Hoskins, Anderson and MacAlister have published studies on this relationship. In the main this relationship is based on clinical findings, such as the very frequent association of rheumatism, chorea and endocarditis.

Of late years more attention has been paid to the bacteriology of chorea. To quote from Church:

Dana found a coccus in a case of chorea in which there was a leptomeningitis of the brain and of the upper part of the cord. In a severe case of chorea and rheumatic endocarditis Triboulet found Achalmé's bacillus. In two cases Apert found Triboulet's coccus. Westphall, Wassermann, and Malkoff found a coccus in the brain of one patient. Poynton and Paine isolated a similar coccus in several cases of chorea. In three cases Beaton and Walker found the same coccus.

Camisa and Guervier have independently reported the finding of cocci in the blood of chorea patients. In their reports the cultural characteristics are not fully given, but so far as given there is no difference between their findings and those of Poynton and Paine.

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* This article is abbreviated in THE JOURNAL by omission of the bibliography. It appears in full in the author's reprints, a copy of which will be sent by him on receipt of an addressed stamped envelope.

In January of this year Collins reported a case of chorea as cured by treatment with an autogenous vaccine prepared from a coccus obtained by lumbar puncture.

The following cases are reported, one in Bellevue Hospital from the service of W. Gilman Thompson, and one in private practice.

CASE 1.—History.—On admission of the patient, a woman, aged 20, to the hospital, her speech was so inarticulate that it was difficult to obtain a history. The following was learned from visitors: The father and mother were dead—cause not known. The patient had no brothers or sisters. There was no history of any of the common diseases of childhood. The patient had not had typhoid, malaria, rheumatism, tonsillitis, torticollis or chorea. The patient was unmarried, and had one child 4 months old. So far as could be ascertained the patient's pregnancy was normal excepting for occasional vomiting. There was no history of venereal disease.

About April 1, 1913, the patient's right wrist became painful, swollen and hot. At the same time speech became inarticulate. Also she began to have involuntary spasmodic movements, especially marked in the head, but occurring throughout the body. The pain in the right wrist lasted about two days, after which the small joints of the right hand became involved. This did not clear up. On April 29, the left hand became involved in all joints. The patient was unable to sleep on account of the jactitation.

Physical Examination.—This revealed an acute multiple arthritis, a chronic valvular endocarditis, and pyorrhea alveolaris. Otherwise it was negative. There were no petechiae. The temperature on admission was 101 F. and gradually rose to 106 F. at the time of death three days later. The pulse and respirations were commensurate with the temperature.

Blood-Culture.—April 29, 1913, a culture of blood from a vein was made in North's agar at 43 C. (109.4 F.) by pouring five plates. The temperature of the incubator was 37 C. (98.6 F.). No growth appeared on any plate for eight days, when all showed colonies of the following characters:

1. They were uniformly distributed on the plates (from five to nineteen colonies to a plate) and formed below the surface of the medium.
2. The colonies and the immediate vicinity were green. In growths without blood this color did not appear.
3. The colonies were pin-point in size and did not greatly enlarge on further incubation.
4. There was no hemolysis.
5. When grown in broth, chains of eight to ten were formed. Each coccus was very small, and sometimes slightly elongated. When grown in bile medium the cocci were not dissolved. Litmus milk showed acid production in three days with coagulation, but no peptonization. Acid was produced in the following carbohydrate mediums: lactose, dextrose, arabinose, raffinose and saccharose, but not in dextrin, mannite and salicin. Inulin was not coagulated after ten days. (These cultural methods were suggested by Dr. Thro, who will publish his methods in detail later.)
6. The coccus retained the Gram stain.
7. There were no capsules.

Control.—The blood from a convalescent typhoid patient was used as control, and all plates remained sterile. The bloods were taken within a few minutes of each other and were treated exactly alike.

May 1, 1913, another specimen of blood was taken, controlled and treated in the same manner. The same coccus was again isolated and treated to the same cultural tests with the same results.

CASE 2 (from private practice).—History.—The patient was a girl aged 9. The father was alive and well. The mother had an acute rheumatic fever twice, followed by chronic endocarditis. The patient had acute rheumatic fever when 3 years old, complicated by endocarditis, and had had tonsillitis frequently. In December, 1912, the patient's heart lost compensation following a severe attack of tonsillitis.

On this account she was kept in bed and given a milk diet. At this time there was no fever. Later, in May, 1913, however, a low grade of fever developed, and in a few days a well-marked chorea. There was no joint involvement. The heart at this time was fairly well compensating. With the development of the chorea the child became stupid and the jactitation of her arms and face so marked that she had very little sleep.

Blood-Culture.—May 30, 1913, a culture of blood from a vein was made in North's agar, poured in five plates. The temperature of the incubator was 37 C. No growth appeared on any plate for six days, when four plates showed colonies (one remained sterile) of the same character as the colonies in the preceding case, excepting that acid was not produced in saccharose. The staining characters were the same as in Case 1. The control was accomplished in the same manner as in Case 1.

June 15, 1913, the coccus grown from Case 2 was used in the preparation of an antigen and the patient's serum was tested against it with positive result for complement fixation. The serum from a convalescent typhoid was used as control, and the test was negative. The technic was that of Schwartz and MacNeil for gonococcus and of Hastings for streptococcus. A second test was made with stock-mixed antigen prepared from two strains of *Streptococcus viridans* isolated from the blood of two patients with chronic infectious endocarditis. The test was positive.

June 20, 1913, cultures were made from the crypts of the tonsils in Case 2 and a coccus culturally identical with the coccus found in the blood was found. An antigen was made from this coccus and tested against the patient's serum. The result was positive. The blood was again taken from the vein of the patient as before. The same coccus was isolated. This time it was obtained on all plates. The complement-fixation tests as done on June 15, 1913, were repeated with positive results.

A study of these cases shows that the organism found in the blood in the two cases in no way differs from the description of the *Micrococcus rheumaticus* of Poynton and Paine, but on the other hand it is culturally identical with the description of the green-producing streptococcus of Schottmueller. The fact that the coccus of Schottmueller and the coccus of Poynton and Paine are culturally identical was observed by Hastings in 1912, and later worked out by Thro at the suggestion of Hastings.

Undoubtedly the coccus isolated by Dana and others mentioned before is identical with the coccus found in the two cases reported. The number of cases, however, is too small to form definite opinions as to the etiology of chorea. Certainly more work along these lines is indicated. That the coccus found in the blood is associated with endocarditis there is no doubt; but that it is the etiologic factor sine qua non in chorea is not proved.

The peculiarities of the coccus isolated are as follows:

1. It is of very slow growth. Sometimes the *Streptococcus viridans* does not appear in the original blood-culture for twelve days.
2. Green is produced on blood-agar plates.
3. It is of relatively slight toxicity.
4. It is not dissolved by bile as is the pneumococcus.
5. It does not peptonize milk as does *Micrococcus zymogenes*.

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Encouraging the Health Department.—Every thoughtful citizen should know what work the health department is doing and the extent of protection from disease that is being given to him and to those dear to him. Such interest will in itself insure more efficient work, for the health department needs the moral support, the approval and at times the cooperation of all intelligent citizens.—John W. Trask, *Pub. Health Rep.*

RELATION OF THE PATHOLOGY AND THE CLINICAL SYMPTOMS OF SIMPLE AND EXOPHTHALMIC GOITER *

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I have recently reviewed in fixed tissues the pathology, both gross and microscopic, of all the thyroid glands now in the laboratories of the Mayo clinic which have been removed from patients on the "exophthalmic goiter" list from Jan. 1, 1905, to Jan. 1, 1912, a total of 1,208 exophthalmic thyroids. My report on these specimens has been published elsewhere.¹ I have also examined, in the same manner, all the thyroids now in the laboratory removed from patients on the clinical "simple goiter" list from Jan. 1, 1905, to June 1, 1913, a total of 2,356 simple goiters.

The clinical grouping of these cases is not so simple as would be indicated by the two lists, "exophthalmic" and "simple." While the lists express their clinical grouping as the cases would ordinarily be arranged in most clinics, Plummer² has recently differentiated the goiters into three clinical groups: A, true exophthalmics distinguished by relatively rapid development, exophthalmos, etc.; B, toxic non-exophthalmics distinguished from the preceding by slow development, absence of exophthalmos, etc.; and C, non-toxic goiters, distinguished from both of the preceding by entire absence of toxic symptoms. It is therefore necessary to remember that in our "exophthalmic goiter" list, 79 per cent. are true exophthalmics, 21 per cent. are toxic non-exophthalmics and in the "simple goiter" list, 17 per cent. are toxic non-exophthalmics and 83 per cent. are non-toxic.

Each acinus of the thyroid gland can take on changes unlike those found within those adjoining it. Hence it is necessary in attempting to determine the dominant pathologic condition of the gland for purposes of classification to make a detailed analysis from the study of sections from many areas and finally to summarize the tabulated record of the observations. Such a summary can best be made from a tabulation in which numerical equivalents are used wherever possible to indicate degrees, amounts, etc. Without going into the minutiae of the specimens which I have examined, I wish to present herewith a broad summary of the results.

An examination of the accompanying table will reveal the following salient points:

1. Practically all cases of clinically true exophthalmic goiter show marked primary hypertrophy and hyperplasia of the parenchyma of the thyroid gland. Furthermore, as I have shown elsewhere,³ the clinical stage of development of the disease is paralleled by the stage of development of the pathologic condition in sufficiently marked degree that one may estimate the clinical condition from the pathologic examination with about 80 per cent. of accuracy. The degree of severity of the clinical condition is similarly paralleled by the pathologic condition of the gland. The relationship between hypertrophy and hyperplasia of the thyroid gland and the clinical symptoms of true exophthalmic goiter is remarkably constant.

* Read in the Section on Pathology and Physiology of the American Medical Association, at the Sixty-Fourth Annual Session held at Minneapolis, June, 1913.

1. Wilson: *Am. Jour. Med. Sc.*, 1913.

2. Plummer: *Am. Jour. Med. Sc.*, 1913.

3. *Am. Jour. Med. Sc.*, 1913, and *New York Med. Rec.*, 1913.