Animals infected with B. typhosus have developed only in rare instances a disease at all comparable to that in man. So far as practical serum therapy is concerned, it has ever, in this disease, shown negative results.

Media Used as an Aid to the Isolation of the Bacillus Typhosus.—Many different media have been devised for use in isolating this organism, but there are only four which have stood the test of time, and which, in the hands of the trained bacteriologist, are admitted to be more or less effective in isolating the typhoid bacilli. The simplest one is that devised by Hiss. For completing the differentiation, however, Hiss uses two different media. His first step is to plate out some of the suspected material in a medium the composition of which is as follows:

Hiss' Plating Medium.

	Gm.
Agar	15.
Gelatin	15.
Liebig's extract	5.
Sodium chloride	5.
Dextrose	10.
Distilled water	1,000.

The agar is first melted and then the rest of the ingredients are added. After the mixture has boiled for a few minutes, it is allowed to cool and is cleared with the white of two eggs. Then it should be boiled again and filtered through a thin layer of absorbent cotton. Before filtering see that the total amount of fluid is 1,000 c.c.; and, if it be found to be less than this amount, add enough hot distilled water to bring it up to that point.

I have found that this is one of the most important points in making up this plating medium. No acid or alkali need be added to the mixture.

In this plating medium the typhoid colonies form thready growths, while the colon colonies are round with smooth edges. The colonies showing threads are fished out and plated in Hiss' tube medium, which is composed as follows:

Hiss' Tube Medium.

	Gm.
Agar	5.
Gelatin	80.
Liebig's extract	5.
Sodium chloride	5.
Dextrose	10.
Distilled water	1,000.

This medium differs from the first, as will be observed, in having 10 gm. less of agar and 65 gm. more of gelatin. The mixture is also cleared with the white of two eggs and is corrected to 1.5 acid, phenolphthalein being the indicator.

In this tube medium the Bacillus typhosus clouds it throughout in twenty-four hours. B. coli generally shows growth and gas formation only along the line of puncture. This medium has given us many excellent results, and I prefer it to all the others.

Elsner's Method (*after Park*).—1st. Grate 0.5 kgm. of small potates to a fine pulp and add one litre of cold water; let it stand over night in a cool place.

2d. Wash thoroughly and strain through a fine cloth. This must be done while the mixture is cold.

3d. Boil the filtrates and filter again.

4th. Add ten per cent. of gelatin and boil until it is dissolved.

5th. Test the acidity and have it so that 3 c.c. of a decinormal sodium-hydrate solution will neutralize 10 c.c. of the medium, phenolphthalein being the indicator.

6th. Boil and clear with egg.

7th. Filter through cotton and then through paper.

8th. To the filtrate add one per cent. of potassium iodide. (Use a solution so made that 1 c.c. shall contain 1 gm. of the salt.)

9th. Decant into tubes and sterilize.

The incubator for this medium must be kept at from 22° to 24° C.

The plates must be thoroughly cooled before placing in the incubator, as otherwise the difference between B. typhosus and B. coli would not be observed.

The colon colonies are the first to develop. They are rough and granular, and have a greenish-brown color; later, the typhoid colonies develop and are small, white, and gleaming, and can best be described as being dew-drop-like in appearance, although occasionally somewhat granular. This is apt to cause some confusion in the mind of the beginner, but one who is familiar with the use of this medium is very little likely to make a mistake. The potassium iodide prevents nearly all other organisms from developing in this medium.

This plating medium, used in conjunction with Hiss' tube medium, gives us a very satisfactory differential method.

The Capaldi plating medium and that formulated by von Drigalski and Conradi have in my hands furnished such variable results that I scarcely think it necessary to describe them here. The latter is a very complicated medium, by no means easy to prepare.

Distribution of the Bacilli Outside the Body.—The Bacillus typhosus may remain in contaminated soil for from two to three months, and in water for nearly the same length of time. On the other hand, if either the soil or the water contains enough organic matter for the support of the organism, it may remain there indefinitely.

The past few years have witnessed no change in our ideas regarding the transmission of typhoid fever. In fact, the theories of that time have merely been strengthened, and all are now agreed that in the vast majority of cases it is through the alimentary tract that the infection gains entrance to our system. In a few rare instances it is believed that the infection has been brought about by the inhalation of the Bacillus typhosus into the lungs.

There still remain to be considered the different methods by which this organism can gain entrance to the intestines. First, we may have a direct infection, that is, from a person suffering from the disease to one who has come in contact with the patient. When infection occurs in this manner some infected material must pass, through carelessness, to the alimentary canal of the individual contracting the disease; for, if perfect cleanliness and caution are observed, this form of infection need never occur.

Unless the excreta of the patient be thoroughly disinfected they will pollute the soil, and the infective organisms which they contain will remain quiescent until they are washed into some water supply, from which they gain entrance into some other human being. This may happen in any of the following ways: directly, as in drinking water or in ice, or in milk to which contaminated water has been added, either for purposes of dilution or in cleansing the receptacle. In milk the bacilli will multiply rapidly, unless the milk be kept constantly iced. If there be a large source of pollution, from which the polluted material drains into a river or creek, the submerged banks of which are used for the fattening of oysters, these will take in the bacilli and will furnish them, if decomposition should begin to develop in the host, with a soil most favorable for their rapid multiplication. It is under these circumstances that oysters may serve as the source of typhoid infection among those who eat them in an uncooked state. (At some later date the author proposes to publish the experiments which he has made in this special field.)

If the excreta be thrown into sinks and privies where flies congregate in large numbers, these insects will transfer the infected material to the house—*i.e.*, they will deposit it upon any food, cooked or uncooked, to which they may gain access. This is probably a frequent mode of spreading typhoid infection among the different members of a family after one of their number has been taken ill with the disease. Nothing short of the most thorough disinfection will prevent such a spreading of typhoid fever.

Raw vegetables may serve as carriers of the disease

provided they have been watered with infected material or have been washed in infected water, in preparation for their appearance on the table.

Ice cream, when manufactured of milk or cream which contains typhoid bacilli, and which has not been cooked, may serve to communicate the disease.

Major Firth, of the English Army Medical Corps, has recently shown that clothing which has been soiled by the excreta of a patient suffering with this disease may retain the virulent typhoid bacilli at the end of eighty-four days. Consequently soiled clothing, unless disinfected, may be a means of spreading the disease. The same authority has also shown that the bacilli may remain fully virulent in the soil for eighty-five days, and we know from other observations that it can remain so for much longer periods. Major Firth also claims that they may retain their virulence for twenty-five days after having been dried and blown about as dust. If this be so, it is certainly a matter of great importance, for it shows that the typhoid bacillus is a much more resistant organism than we have given it credit for being. This observation, however, must first be confirmed by other authorities before we can accept it as a fact.

To sum up, then, we find that there are three great roads by which infection reaches human beings. These are, first, personal contamination from person to person; second, contamination of water supply and therefore of milk and food; and third, the spread of the bacilli by household insects such as flies, cockroaches, etc.

From this it will be seen that the great weapons for combating the spread of this disease are, first, thorough disinfection of all excreta from the patient; and at this point I wish to emphasize the fact that it is of the greatest importance to disinfect and to handle carefully the urine of these patients. Our second weapon is the thorough sanitary supervision of our water supplies so that our water-sheds may escape contamination.

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VISION, DISORDERS OF: CHROMATOPSIA (*Colored Vision*).—Chromatopsia is a modification of the visual sensation, as a result of which all objects appear of a certain color (red, purple, blue, yellow, green, white), without any effect upon the acuteness of vision or any visible changes in the fundus.

Erythropsia (*Red Vision*), the most common variety, is not infrequent after cataract extraction, occurring in three to five per cent. of cases (Becker), and after exposure to intense light, for example, sunlit snow fields especially in high regions, brilliant electric light, flashes of lightning, and observation of the sun. This visual disturbance becomes more marked when the illumination is suddenly diminished, as after going from the open into a house. After cataract extraction there is less frequently purple or *blue vision* (*kyanopsia*), or the patient complains of objects appearing of a glaring white. The phenomenon generally appears shortly after the operation, or after some days or weeks; it lasts a variable number of hours, days, weeks, or months; it may be constant or intermittent; it generally disappears in the course of a few days or weeks. No treatment is called for beyond the wearing of smoke-tinted glasses; potassic bromide has been recommended in these cases.

Independently of cataract extraction, the occurrence of colored vision is favored by dilatation of the pupil, congenital coloboma of the iris, iridectomy, by excitement of any sort, and by elevation of body-temperature. Red vision is an occasional symptom of optic-nerve atrophy, glaucoma, nyctalopia, migraine, hysteria, hystero-traumatic amblyopia, and amaurosis, exhausting diseases, and severe fevers; it sometimes occurs with intra-ocular hemorrhage; it may be part of the epileptic aura; it is said to be caused by coffee in rare instances. Blue vision is occasionally complained of by patients suffering from retinitis albuminurica and detachment of the retina, and may also follow the use of cannabis indica. *Green vision* (*chloropsia*) is a rare symptom of detachment of the retina, optic-nerve atrophy, and aphakia as the result of cataract extraction. Blind eyes occasionally are conscious of colored lights, probably due to irritation of the visual centres.

It seems probable that chromotopsia may be due either to central irritation or to local causes. No entirely satisfactory explanation of the phenomenon has yet been offered. Fuchs attributes red vision to the action of strong light on the visual purple and its slow regeneration under less intense light; but the absence of visual purple at the macula upsets this theory. Snellen believes it to be due to the coloring of white light by its passage through the translucent and vascular lids and choroid, and the subsequent diffusion of this reddish light over the retina. After the extraction of cataract, upon exposure to bright light, the lids are partly closed; there is thus a small central pupillary opening for white light, while the periphery of the retina is flooded with red light which has come through the lids. When the intensity of the illumination is reduced, the red perception of the periphery changes to a complementary green as a result of fatigue, while central vision appears red by contrast. The blue vision after cataract extraction is attributed by Burnett to fatigue of the retina as a result of long-continued exposure to light rendered yellow by passage through amber-colored cataracts, giving blue as a residual sensation in white light.

Toxic Chromatopsia.—Colored vision, usually yellow (*xanthopsia*), is one of the symptoms of the poisonous effects of certain drugs, of which santonin is the most common example; this agent may, however, produce green vision, or rarely red or blue vision. Other drugs which may produce chromatopsia are amyl nitrite, picric acid, chromic acid (as a result of local applications), osmic acid, digitalis, carbonic oxide, and tobacco. Xanthopsia also occurs as an early symptom of catarrhal jaundice, being due probably to the discoloration of the dioptric media and the structures of the eyeball by bile pigment. Yellow vision is also seen after dazzling from electric light, and occasionally accompanies nyctalopia.

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WOLFFIAN BODY, PATHOLOGY OF.—In mammalian embryos the mesonephros or Wolffian body is a rather pyriform body symmetrically placed in the abdominal cavity. In very young embryos it is, next to the liver, the largest abdominal organ. It was first observed by Wolff in 1759. The exact origin of the Wolffian body is not yet determined; some authors hold that it is ectodermal, others that it is mesodermal, while others still ascribe to it both an ectodermal and a mesodermal origin. It is developed from the pronephric or Wolffian duct and from the mesonephric cords. The origin of the latter has not yet been wholly worked out in the case of the human body. In the lower mammals they arise through aggregations of the cells of the Wolffian ridge into solid cords which at first are not connected with the Wolffian duct or the cœlomic epithelium. These cords acquire a lumen and connect at one end with the duct, while at the other end there is a condensation of the mesoderm, forming the glomeruli, into which vessels from the aorta penetrate. The tubules increase in length rapidly and in the human embryo assume an **S**-shape. Secondary and tertiary tubules develop in connection with each of the primary ones, but the mode and origin of these have not yet been determined, some writers hold-