

the soda water fountain but it is one which receives universal patronage. I do not, I hope, convey the impression that the drinking of carbonated water mixed with a syrup and flavored with a fruit, is objectionable. What I do object to, however, is serving to the community those articles which are not of the proper quality. When the pharmacist dispenses artificial flavors and artificial colors to the public under the guise of the genuine article, he is certainly overstepping the rules of ethics regulating his relations to the consumer. Of course, there are objections to the ice cold character of the beverage, especially in the heated months when large quantities of such ice cold drink are consumed, but since I know of no way to raise the temperature of the beverage without disappointing the consumer and injuring the business, I shall content myself by urging on the pharmaceutical profession the necessity of inducing their customers to drink slowly and deliberately, thus adding to the pleasure of the consumer and detracting nothing from the profit of the dispenser. It might be well if above each soda water fountain should be hung a placard, so that all should see—

“Full many a man, both young and old,
Has gone to his sarcophagus
By pouring water icy cold,
Adown his hot esophagus.”

Then again, the pharmacist is in many cases an emergency physician. In his studies he must learn the principles of therapeutics and to a certain extent their practice. He must be appealed to from time to time in cases of emergency and accident for immediate help, and, therefore, in his relations to the public he must be so much of a physician as to extend at least the first aid in the way of drugs and remedies and other help.

The pharmacist, finally in his relations to the public, must not allow himself to keep a saloon. There are many of the so-called proprietary remedies, to which I have alluded, in which the principal ingredient is alcohol. God only knows the source of this alcohol, but at least it is a stimulant and an intoxicant. No pharmacist who regards rightly the principles of ethics toward the consumer will sell or keep on sale such beverages. If he does, he should at least obey the laws and take out a license therefor. If, by the rules of his profession or by the laws of the country the pharmacist is not allowed to sell the genuine alcoholic beverages, such as beer, wine, whiskey and brandy, he certainly should not be allowed to deal in any kind of misbranded and perhaps injurious compounds containing practically the same active principles under fanciful, misleading and deceptive names.

Finally, I would say that both the pharmacist and the physician should cultivate the most friendly relations toward each other in their professions. Sometimes each must exercise the profession of the other. Thus the physician, especially in the country, often must exercise the functions of the peripatetic pharmacist. So the pharmacist in the city is often called on to exercise the functions of the resident physician. It is a pleasing fact to know that the great national associations of pharmacy and medicine are drawing closer and closer together and there is no reason why they should not amalgamate into a single body, having for its object the strengthening of the great principles on which the two professions are based and the good of the whole community which they are called on to serve. To this end, I should like to see more and more entering into the schools of pharmacy the elementary prin-

ciples of medicine, and I should like to see introduced more and more into the medical schools the true principles of pharmacy. There is one science which serves perhaps more than others to bind these two professions together, that is the science of chemistry. The physician first of all must be a chemist and must understand the intricate and wonderful chemical reactions which are taking place constantly in the body, and which, when disturbed, can only be brought back to normal conditions by the supply of proper chemical reagents. The pharmacist must understand first of all the principles of chemical reactions. His profession deals in the source of compounds, not merely of vegetable and animal origin, but covering the whole range of chemical products. Chemistry is the bond, then, which unites these two great professions and I am glad to know that in this school you have had instruction in chemistry which must be of the best. I have known your professor for years and there is no one who stands higher in the profession of chemistry, not only in this but in other countries, than Dr. Hillebrand.

You have now completed the course prescribed for the beginning of your professional career. You expect in this profession to earn a livelihood. To stand well in the community remember that first of all it is the duty of each citizen to be a patriot, to be devoted to his country and its interests, and to this end he can best serve his country by best serving his profession by standing immovably on the principles of ethics which I have briefly set forth. You should resolve that you will do what is right by your profession, by the physician and by the public; that you will never deceive a patron; that you will never take unfair advantage of a professional brother; that you will never put into a physician's prescription anything that he does not ask for; that you will never sell clandestinely to a customer an article which you would not be allowed to sell by its own name. By practicing honesty and industry you will succeed; you will become successful pharmacists; you will become good citizens.

ACUTE EPIDEMIC DYSENTERY.*

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The history of the study of the dysentery bacillus began with the discovery by Shiga, in 1897, of an organism whose presence he was able to demonstrate in every one of a large number of cases of acute dysentery. This bacillus differed from the colon bacillus especially in that it did not ferment glucose with the formation of visible quantities of gas, that it did not produce indol, and was motile only when freshly isolated from the intestine. It reacted with the serum of those sick with dysentery and usually for months after convalescence, and did not react in the trials made with the serum of those who had not had dysentery. There were more than 89,000 cases of dysentery in Japan in 1897, and Shiga has demonstrated that in the majority of these cases the bacillus described by him is the exciting factor.

Following Shiga's investigations, Flexner examined bacteriologically a number of cases of Philippine dysentery and found the Shiga bacillus in all of the suitable cases. Strong and Musgrave also found the bacilli in

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many acute and in some subacute cases in the Philippines. Of 111 fatal cases among soldiers, they class 21 as acute specific (bacillary) dysentery, 11 as subacute specific dysentery, and 79 as amebic dysentery. In the same year (1899), Kruse found the same bacilli in Germany and Spronck in Holland.

The investigations made during 1901 were principally carried on by E. B. Vedder and C. W. Duval, working under the direction of Flexner. They found similar bacilli present in the stools in 5 cases in Philadelphia, in 3 cases in Lancaster County Almshouse, and in 14 cases examined in an epidemic at Springside House, New Haven, Conn., where 50 out of 350 inmates were attacked. In the summer of 1902 (under Flexner's direction), Duval and Bassett found similar bacilli in a number of cases of dysentery in a children's hospital in Baltimore. Some of these were cases of dysentery and some were simply cases of summer diarrhea. Park and Dunham and Wollstein succeeded in isolating the bacillus from a few cases in Seal Harbor, Maine, Tuckahoe, N. Y., and New York City. Kruse found bacilli, which resembled the Shiga bacillus, in an epidemic in an insane asylum, but which failed to agglutinate in the blood of animals infected with Shiga bacilli, nor did the blood of these patients agglutinate the Shiga bacillus.

The cultural characteristics of the dysentery bacillus were given quite fully by Shiga in 1898, and are in many respects similar to those of the typhoid bacillus. Vedder and Duval gave some details of methods for obtaining the bacilli from the feces. The bacilli described by Shiga are small, thick rods with rounded ends similar in appearance to the colon bacilli. In cultures they are usually found singly and in pairs. When discovered they may be somewhat motile, but if so the motility is lost after prolonged cultivation on artificial media. Flagella can be demonstrated with difficulty. The bacilli are easily stained and are negative to Gram. They grow in ordinary nutrient media, better in the presence of oxygen. Gelatin is not liquefied. The optimum temperature is about 37 C., but they develop slowly at temperatures below 20 C.

Duval and Bassett recommend collecting the stools from infants on a sterile gauze pad placed, in the usual manner, over the buttocks after cleansing the parts with bichlorid, the pad being retained by a napkin. The stool should be examined immediately, if possible. Stools containing blood and mucus are especially favorable for isolating the bacillus of dysentery. Enough material, usually from three to six loopfuls, is taken from the blood or mucus in the stool to render cloudy about 10 c.c. of sterile bouillon. The dilutions are made in the usual way, after the settling of the coarser particles, by carrying two, four, six or eight loopfuls of the suspension, depending on its opacity, into a second bouillon tube and from this into melted agar tubes from which plates are formed. The most successful plates present from 25 to 200 superficial colonies. The most favorable material is obtained at autopsy, after opening the lower intestine with sterile instruments, by scraping the mucous membrane with a sterile knife; the scrapings being introduced into a bouillon and plated as above. At the end of twenty-four hours' incubation, the first crop of colonies on the plates should be marked off with a blue wax pencil, as described by Vedder and Duval, and the plates returned to the incubator for another twenty-four hours. The second crop of colonies is then examined and those presenting the character of *B. dys-*

enteriae are transplanted to glucose-agar. *B. dysenteriae* is to be sought among the non-gas forming varieties. Duval and Bassett describe the agar plate colonies at the end of twenty-four hours as being delicate and semi-translucent and bluish-white in color; at forty-eight hours, they are more opaque, whiter, of dull reflection and not elevated perceptibly above the medium. Under low magnification, a triple zone is evident. Colonies older than forty-eight hours can not be regarded as readily distinguishable from those of *B. coli*. Five types of the organism have been isolated: (1) The Shiga type, which attacks glucose and no other sugar; (2) the Flexner-Harris type, which attacks glucose, mannite and dextrine, but not lactose; (3) "Bacillus Y" of Hiss and Russell, which attacks glucose and mannite; (4) Duval and Shorer "Bacillus A," which attacks glucose, mannite, and lactose; (5) Duval and Shorer "Bacillus B," which attacks glucose, mannite, dextrine, and lactose. The Flexner-Harris type has been most frequently encountered in this country.

Bacteriologic reports on the investigations of 1903 were made by Duval and Shorer, Wollstein and Dewey, Gay and Stanton, Cordes, Waite, Kendall, Lewis, and Bassett. A pathologic report was made by John Howland, a report on blood reactions by Charles K. Winne, and clinical reports by La Fetra and Howland, Knox, Cordes, Amberg, Freeman, Warfield, Hastings, Reed.

Martha Wollstein also reported on the "Dysentery Bacillus in Relation to the Normal Intestines in Infants." The investigations were carried on in the cities of New York, Philadelphia, Boston and Baltimore under a grant from the Rockefeller Institute. In all, 412 cases were studied, and of these, 279, or 63.2 per cent., yielded the dysentery bacillus. These represent nine separate and distinct groups of cases studied by different bacteriologists, and one group gave as high a percentage as 94 per cent., while in another only 25 per cent. of the cases yielded the organism. This, however, was in the tenement district in New York, where the stools had to be transported to a considerable distance before being examined and where delay made the isolation more difficult. The same investigators working in Bellevue Hospital found the organism in 65 per cent. of the cases examined. The character of the stools was reported in 397 cases, and of these 120 were composed of blood and mucus, 36 of mucus, 226 of mucus and feces, and 15 of feces alone. The bacillus was recovered from 265 of these stools, from 88 which contained blood and mucus, from 25 which contained mucus alone, from 148 containing mucus and feces, and from 4 containing apparently nothing but feces. Therefore, only 4 successful cases contained neither blood nor mucus. Visible blood was contained in about one-third of the successful specimens. The most successful specimens, then, were those containing mucus and feces. Shiga, Flexner, Kruse, Duval and Bassett and Wollstein have in turn sought the organism in the discharges of healthy adults or children, but unsuccessfully. In 1903, Duval isolated a very few dysentery bacilli from the stools of two healthy milk-fed children to whom mild cathartics had been administered.

Flexner mentions the fact that while infections with the dysentery bacillus in adults often extend with epidemic severity, the cases of infection in children seem to be examples of individual inoculation, although occasional examples of contagion from child to child and sporadic infection among adults does occur. It can only be conjectured whether the bacillus gains access to the

intestinal tract with milk, water or other substances. It may possibly exist as a saprophyte in the intestinal contents and become parasitic only after repeated insults to the mucous membrane. Flexner considers it possible that two modes of infection may occur, autoinfection and "extra-infection." Most of the infants whose stools were examined and who were not in hospitals and institutions had been given unboiled water, but the organism has not been isolated from water.

Shiga tested the agglutination reaction with the blood serum of something more than 100 persons who either had dysentery or were convalescing from it, and found that in most cases, after a week or ten days, dilutions of 1 part of serum to 30 of water gave agglutination, and often 1 part to 50 or more. The reaction was absent with persons who had not had dysentery, but with convalescents the reaction remained over a varied length of time, in one case as long as eight months. Shiga was disposed to regard the occurrence of the agglutination reaction in even those low dilutions as of great diagnostic significance. In summing up his remarks on this subject, he said: "*B. dysenteriae* is agglutinated only by the blood of dysenteric patients; never by the blood of those sick with other diseases or of healthy individuals."

These conclusions were apparently confirmed by findings of Kruse, Flexner, Strong and others. Lieutenant Strong tested his Manila bacillus with serum from 100 individuals, of whom 12 were well and the others suffering from various disorders. The result showed a partial reaction in the case of one healthy individual and a positive reaction in one surgical case, a 1 to 10 dilution being employed and observation made at the end of thirty minutes.

It came to Dr. Park's notice that in some instances the bacillus did react with the blood of non-infected persons in fairly high dilutions, and he suggested that I investigate this phase of the subject. The bacillus was tested with the blood serum of 114 patients in Bellevue Hospital and the dispensary of the University and Bellevue Hospital Medical College. The bacilli employed were from Shiga's Japan (alkali type) and Flexner's Manila (acid type) cultures. Dilutions of 1 to 10, 1 to 20, 1 to 50 and 1 to 100 were employed, and the average time of observation was from two and one-half to three hours. An attempt was made not only to signify the presence of a reaction, but to indicate the degree of completeness of the clumping which occurred. It was found that in all cases of infants under one year, there was a complete absence of reaction, except in one case of a 10-months-old child where very slight clumping occurred in a 1 to 10 dilution. In all cases over one year, clumping occurred in some dilution. The conclusions¹ were to the effect that the serum of non-dysenteric adult persons does agglutinate the bacilli frequently in a 1 to 20 and some in a higher dilution; that the agglutinating power is wanting in the blood of non-dysenteric young infants (under one year); that the Shiga type clumps a little more readily than the Flexner type, and that a decided and prompt reaction in dilutions of 1 to 20 or higher in infants under one year and in 1 to 50 or higher in older persons who have not recently suffered from intestinal disease is probably pathognomonic of acute epidemic dysentery.

Among the conclusions reached by Dr. Flexner, after surveying the results of the investigations of 1902 and 1903 in this country, are the following:

1. The *B. dysenteriae* can be isolated from the intestinal discharges, and the intestinal mucosa of a large percentage of children suffering from the diarrheal diseases prevailing along the Atlantic seaboard of the United States during the summer months.

2. The bacillus is to be sought, especially in the mucus thrown off by the intestinal mucosa and in the substance of the mucous membrane itself.

3. Blood admixture makes the isolation easier, as it generally indicates severe infections.

4. The number of colonies recoverable has some relation to the severity of the lesions and the symptoms.

5. The number of colonies obtainable is usually far below the number of colonies of the ordinary intestinal bacteria which develop on the plates.

6. The type most often found is the so-called Flexner-Harris organism.

7. Types of *B. dysenteriae* of less well-established properties have also been encountered.

8. The blood of the children suffering from diarrheal disease agglutinates at times the bacillus of dysentery in high dilutions; but this agglutination by the blood does not proceed hand in hand with the occurrence of the bacillus in the intestine. The agglutination reaction is not to be treated as an index of the presence of, or infection with, *B. dysenteriae*.

9. The close association of *B. dysenteriae* with the intestinal mucosa, the increased numbers of the organism found under definite pathologic conditions, the established pathogenic action of the bacillus for human beings, and the specific blood changes met with in many of the cases of diarrheal disease, all speak for a relationship of cause and effect between the bacillus of dysentery and the lesions of the intestine.

10. It is probable that *B. dysenteriae* appears, at times, among the saprophytic bacteria of the contents of the intestine.

11. The contagiousness of bacillary dysentery among adults and the rarer instances of diarrheal contagion among children prove the necessity of recognizing an "extra-infectious" origin of the disease.

12. The possible action of any of the many bacteria of the discharges, including the streptococcus, is not excluded by the special findings of the investigation.

13. The central fact brought out by the collective investigation is the frequent occurrence in the diarrheal diseases of children of a specific micro-organism, which hitherto has been held to be of special pathogenic action in human beings, and to be the cause of that form of dysentery among adults and children which is characterized by necrotic and pseudo-membranous lesions of the intestine and marked infectiousness.

14. The lesions of the intestines observed in the children who succumbed to the diarrheal diseases treated of in the reports were very varied in character, but there were rarely found among them the particular kinds of pathologic changes which characterize pseudo-membranous enterocolitis.

Dr. Holt, in reviewing the results from a clinical standpoint, mentions the following points: 1. Infection with the *B. dysenteriae* occurs under quite a wide variety of conditions. It is seen in breast-fed infants as well as in those artificially fed. 2. It occurs as (a) an acute primary infection in children previously well; (b) as a subacute infection without previous acute symptoms; (c) coincident with or following other acute diseases, such as measles, pneumonia, etc.; (d) it is often

1. Medical News, Dec. 5, 1903.

seen as a terminal infection in children suffering from extreme malnutrition or marasmus. 3. It occurs as a mild intestinal disorder with few symptoms, and these hardly more marked than those belonging to intestinal indigestion; also with local symptoms of considerable severity, yet with very little fever or constitutional depression, and finally, in its most severe form, with both local and constitutional symptoms of great severity. 4. It is not a disease of any one locality, having been seen with great and about equal frequency in all the large cities in which investigations were carried on, the only variation in type being that in the warmer cities the proportion of severe acute cases was rather larger. Nor is the disease one of tenements and hospitals, a number of the cases observed being in children living in the best surroundings, even in the country. In its prevalence, it appears to be as widespread as are summer diarrheal diseases.

The clinical reports include observations on 237 cases, and of these 26 children were previously breast-fed. Most of the breast-fed infants exhibited a milder type of the disease than the others. Of the cases studied, 91 were classed as examples of severe infection. These were characterized by much mucus and generally blood in the stools, usually fever, but not always high, and by marked general prostration. There were 81 examples of moderately severe infection, in which there was much mucus, and often blood in the stools, some fever, but not much constitutional depression. There were 63 examples of mild infection, in which the constitutional symptoms were very few; blood was seldom present; there was little or no fever; but the stools almost always contained mucus. There was only one case which at all approached the type of cholera infantum. Seventy-three of the 237 cases were fatal. In the matter of diet, there is some difference of opinion as to the desirability of withholding milk in cases of moderate severity. The intelligent use of milk seemed to give much better results than the substitutes usually employed. In some cases the infection is slight, while the digestive disturbance is severe. On the theory that spreading takes place through the discharges, the Babies' Hospital made a rule that the nurse in charge of the children's napkins should not at the same time have anything to do with the food or feeding.

In all, there were 83 cases in which the antidysenteric serum was employed, and 38 of these terminated fatally. On the whole, the results were disappointing. No unfavorable symptoms followed its use in any case. In only 12 cases did a noteworthy improvement appear to follow its administration. Dr. Holt does not consider that it has been given a sufficient trial. In cases of moderate severity, a dose of 10 c.c. a day is recommended, and in severe cases three times that amount. Of 372 cases studied during the past summer, 73 proved fatal. The antidysenteric serum used was made from horses by the injection first of dead cultures and later of living cultures of the dysentery bacillus. The results of serum treatment were again disappointing, but I have seen no extended account of the investigation. Dr. Louise Tayler-Jones isolated the bacillus from 6 out of 20 cases of dysentery in Washington, D. C., and described 6 other cases as being clinically suggestive of the presence of the bacillus. This proves Washington to be within the zone of distribution.

To epitomize Dr. Knox's experience with serum treatment at the Thomas Wilson Sanitarium, he found it to be of benefit in 5 cases, of doubtful benefit in 5, and in-

ert in 10 of the 20 cases in which it was employed. It seemed to be of more benefit in severe toxic cases than in those of inflammatory type. Most of the cases benefited were those in which comparatively small amounts were given early in the disease. He emphasizes the necessity of promptness in treatment, and goes on to say that if the food can be stopped and the alimentary tract emptied within a few hours after the onset of symptoms, most infections can be aborted. In all his acute cases, milk was stopped for varying periods, and boiled water, with or without egg albumin, dextrinized cereal waters or broths, and later whey was substituted. Gastric lavage was resorted to occasionally and colon irrigation in nearly every case. Calomel or castor oil was given on admission, and large doses of bismuth subnitrate were employed as an intestinal astringent. Opium was sparingly employed. Whiskey or brandy, strychnia, digitalin and atropin were found useful as stimulants. Of 14 patients who had been previously fed on condensed milk, 8, or 50 per cent., died at the sanitarium in spite of treatment, while of the 26 cases given at their houses some form of cow's milk, but 8, or 29 per cent., died, 7 were improved and 10 were permanently cured. Of 17 infants under 6 months in Dr. Knox's series, 10 were bettered and 1 improved, while 6 died, a mortality of 34 per cent.; but of 18 infants between 6 and 12 months of age, only 8 were better, none improved, and 10 died, a death rate of 55 per cent. This difference he attributes to the fact that the untoward effects of improper artificial feeding are most in evidence in cases with weakened constitutions, rickets and the like, during the second half year of an infant's life. Of the 18 children older than one year, but 1, aged 13 months, died.

THE COMMERCE OF SURGERY.*

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"It is further to be observed that just as the self-assertion necessary to the maintenance of society against the state of nature will destroy that society if it is allowed free operation within, so the self-restraint, the essence of the ethical process, which is no less an essential condition of the existence of every polity may, by excess, become ruinous to it.

"In a large proportion of cases, crime and pauperism have nothing to do with heredity; but are the consequence partly of circumstances and partly of the possession of qualities which under different conditions of life might have excited esteem and even admiration. The benevolence and open-handed generosity which adorn a rich man may make a pauper of a poor one; the energy and courage to which the successful soldier owes his rise, the cool and daring subtlety to which the great financier owes his fortune may very easily under unfavorable conditions lead their possessors to the gallops or to the hulks.

"Unless a man's inheritance from the ancestors who fought a good fight in the state of nature, their dose of original sin, is rooted out by some method at present unrevealed; at any rate, to disbelievers in supernaturalism, every child born into this world will still bring with him the instinct of unlimited self-assertion. He will have to learn the lesson of self-restraint and renunciation. But the practice of self-restraint and renunciation is not happiness, though it may be something better.

"One of the oldest and most important elements in any system of government is the conception of justice. Society is impossible unless those who are associated agree to observe certain rules of conduct toward one another; its stability de-

* Read before the Illinois State Medical Society, May, 1905.