
One tonsil from each of 47 swine with gross lesions of tuberculosis was examined; fourteen yielded avian tubercle bacilli. From thirteen, a rapidly-growing saprophytic acid-fast microorganism was isolated. A similar number of tonsils of grossly non-tuberculous swine yielded avian tubercle bacilli in eight cases; saprophytes were recovered from eleven.

The studies indicate that the twenty-four strains of saprophytic acid-fast bacilli are identical. They develop rapidly on glycerinated mediums forming a pasty, gray or cream-colored, rough growth. On liquid mediums a heavy crinkled pellicle which finally sinks is formed. They do not use glucose, lactose, sucrose, sorbitol, mannitol, arabinose, levulose, trehalose or galactose as the sole carbon source on Merrill's medium. Glycerol is utilized with acid formation. Optimum growth occurs at 38°C. No growth occurs at 47°C. They fail to survive an exposure to 60°C. for an hour.

They produce no demonstrable disease in calves, chickens, rabbits or mice. In these animals no sensitivity to tuberculin or homologous culture filtrates was detected. Guinea pigs infrequently developed an abscess following subcutaneous injection of large doses and a transitory sensitivity to avian tuberculin and homologous culture filtrates was demonstrated. Agglutination studies indicate that the strains are antigenically alike and that they have antigens in common with Mycobacterium avium and Mycobacterium phlei.

CARBOHYDRATE METABOLISM OF AEROBACILLUS SPECIES—A PRELIMINARY REPORT. R. W. H. Gillespie, Assistant Professor of Bacteriology University of South Dakota.

A study was made of the degradation of glucose by Aerobacillus macerans and Aerobacillus polymyxa. Cultures of several strains of each species were incubated, aerobically and anaerobically, for 4 to 5 days at 37°C. in 1.0% and 1.5% glucose extract broth. The cultures were then analysed quantitatively for residual reducing sugar, for volatile and non-volatile acids, and for alcohol.

A. polymyxa appears to utilize glucose more rapidly and completely than A. macerans. Volatile and non-volatile acids appear to accumulate more extensively in the A. macerans cultures. Alcohol was found in larger quantities in the A. polymyxa cultures.

Thus, the results indicate that the
degradation of glucose proceeds differently, in rate, at least, in cultures of the two species. An attempt is to be made to correlate differences in carbohydrate metabolism with previously observed differences in oxidation-reduction potential which characterize the species.

Respiratory Factor for Rhizobium. R. H. Burris and P. W. Wilson, University of Wisconsin.


The effect of working butter on the growth of bacteria has been reported previously. As judged by the rate of growth, time of appearance of defects, changes in pH of butter serum and changes in the acidity of fat of butter, organisms are more active in under-worked than in thoroughly worked butter.

Recently the effect of reworking butter on the growth of bacteria was studied in an attempt to explain the deterioration that sometimes occurs under commercial conditions when butter is reworked or when it is printed in a special type of butter printer. Portions of under worked and moderately worked butter made experimentally from pasteurized cream inoculated with various pure cultures of organisms were held several days at approximately 10°C. before reworking. In reworked butter the organisms increased more rapidly and defects appeared more quickly than in the control butter which was not reworked. In reworked butter containing butter culture the pH of the serum decreased more rapidly and reached lower final values than in the control butter while in reworked butter containing a lipolytic organism acid numbers of the fat were higher than in control butter which was not reworked.

Bacteriostasis Due to Sulfapyridine. Robert E. Hoyt, Kenneth J. Johnson and Milton Levine, University of Minnesota.

Effect of Biotin Concentrates on Growth of Rhizobium and Related Species. P. M. West and P. W. Wilson, University of Wisconsin.

Biotin concentrates were found capable, at three hundredths of a gamma per ml., of replacing the stimulative effect of yeast extract on the growth of Rhizobium trifolii 205. A survey of the effect of this preparation on various species of Rhizobium and related forms was made to determine whether this same growth factor was required in all cases for maximum development. All "fast-growers" responded to the biotin concentrate with the exception of a few strains which grew well without the factor and no better in its presence. Rhizobium lupini responded well, but no strains of "slow-growers" of the soybean or cowpea groups showed stimulation even if high levels of biotin concentrate were added. Phytomonas tumefaciens, Achromobacter radiobacter and two species of Azotobacter grew well in the carbohydrate mineral salts base medium and remained unaffected
by biotin additions. "Coenzyme R" preparations tested in place of biotin concentrates at fifty gammas per ml. gave similar results throughout. Azotobacter, due to its ability to synthesize the growth factor for R. trifolii 205 showed no response to the biotin concentrate.

**NOTE ON THE PREPARATION OF ACTIVE CELL-FREE JUICE FROM BACTERIA.**

W. P. Wiggert, M. Silverman, M. F. Utter and C. H. Werkman, Bacteriology Section, Industrial Science Research Institute, Iowa State College, Ames.

An active cell-free juice which attacked hexosediphosphate and hexosediphosphate plus glucose anaerobically was obtained from *Aerobacter indologenes* under the following conditions: 3 grams of cell paste, autolysed 24–30 hours were mixed with 25 grams ground Pyrex glass (ground 24 hours in ball mill) and 7 ml. of M/15 phosphate buffer (pH 7.0). 10 grams of this mixture were ground 5 minutes by hand in an iced mortar and the mixture extracted with 2 ml. of M/15 phosphate buffer (pH 6.6) and clarified on a Beam ultracentrifuge. The supernate showed activity. Juice has been found active after two weeks' storage in a frozen state. Several dehydrogenases were found present by the methylene blue technique.

**IMMUNITY IN CANINE ORAL PAPILLOMATOSIS.** R. J. Goodlow, Department of Bacteriology and Immunology, University of Minnesota.

Virus-induced papillomas of the oral mucoea of young dogs regress spontaneously, leaving the animal resistant to reinfection. That regression is accompanied by development of specific antibodies in the blood serum of infected puppies is evidenced by a positive complement-fixation test.

To 1.5 ml. of saline was added 0.1 ml. of a 0.33 per cent saline suspension of emulsified tumor tissue, and one drop of blood serum of puppies on which papillomas had grown and regressed. This system was placed in the refrigerator for one hour before the addition of 2 units of complement (titrated before each test). After incubation at 37°C. for one hour the hemolytic system was added. Test readings were taken after 45 minutes of incubation. To eliminate the possibility of false positive reactions, the serum and antigen were tested before use for anticomplementary effect.

The blood sera of eight dogs infected with papillomas which had regressed were tested. In all cases complete inhibition of hemolysis, which indicates the presence of specific antibodies, was noted. Negative reactions were obtained with sera from eight normal dogs. The serum of rabbits hyperimmunized to the Shope papilloma virus did not possess the ability to fix complement in the presence of the antigen of canine oral papillomatosis.

**PREPARATION OF BACTERIOLOGICAL PEPTONES.** Einar Leifson, Department of Bacteriology, University of South Dakota, and Ben Diamond, South Dakota State Health Laboratory, Vermillion, South Dakota.

The need for bacteriological peptones made according to detailed published procedures is too obvious to require any further comment. Work was started by the senior author at the Johns Hopkins University some three years ago to remedy this situation. One hundred and fifteen peptones were made, dried, and powdered. The substrates used included beef, beef heart,
beef spleen, beef lung, pork, hog stomach, fish, casein, wheat gluten, and soybean flour. The enzymes used, except papain, were prepared in the laboratory and included pepsin, pancreatin, papain, as well as serial digestions with combinations of these enzymes. Work is in progress with additional substrates. These peptones, in addition to a number of commercial peptones, have been tested extensively for diphtheria-toxin production, growth-promoting properties for some 50 selected strains of bacteria, and suitability for various biochemical tests such as indol, M.R., V.P., double-zone formation by streptococci in blood agar, pigment and gas production. The results are too voluminous to permit even a sketchy summary. The data indicate that peptones as good or better than the present commercial products may be made cheaply and with great ease. Many of the peptones produce high concentrations of diphtheria toxin. The authors invite correspondence, and would welcome cooperation in the making of special tests on the peptones.

Modification of Distemper Virus by Animal Passage. R. G. Green
Department of Bacteriology and Immunology, University of Minnesota.

Strains of distemper virus isolated from various species of the families Mustelidae and Canidae are found, on a basis of general characters and cross immunity tests, to be identical. The cytoplasmic and intranuclear inclusions typical of the distemper virus are seen in all species of these groups. Viruses isolated from naturally infected animals show marked pathogenic properties in such diverse species as the ferret and the dog. Fifty serial transfers of the distemper virus through ferrets result in a virus highly pathogenic for ferrets and related animals but only slightly pathogenic for dogs and foxes. Susceptibility tests and serial transmissions of virus through other species of the family Mustelidae show that passage through members of the family Mustelidae increases the pathogenicity of the virus for species of that family and decreases the severity of the infection for species of the family Canidae. The reciprocal relationship also seems true: passage of the virus serially through members of the family Canidae decreases its virulence for species of the family Mustelidae. The mild infections produced by such modified viruses immunized against subsequent infections with strains of the distemper virus that are highly pathogenic for the species tested in this manner.

Amino Acid Requirements of the Heterofermentative Lactic Acid Bacteria. H. G. Wood, Charles Geiger and C. H. Werkman, Bacteriology Section, Iowa Agricultural Experiment State, Ames.

The amino-acid requirements of three species of heterofermentative lactic acid bacteria L2, Lactobacillus manniotopeus; L4, Lactobacillus buchneri; L5, Lactobacillus lycopersici were determined on the basis of optimum acid production in a basal medium containing glucose, thiamin, riboflavin, sodium acetate and inorganic salts including ammonium sulfate. Nineteen amino-acids, those present in hydrolyzed casein with the exception of hydroxyglutamic acid, were used in the investigation. When all nineteen amino acids were added to the medium growth was luxuriant. When each amino-acid was omitted singly and the remaining eighteen added, acid production and growth was retarded in each case with the exception of glycine,
proline, hydroxyproline, leucine and isoleucine, also tryptophane for culture LA. When both leucine and isoleucine were removed acid production was not optimum. Leucine and isoleucine are replaceable, i.e. one of the two is needed but not both. The group consisting of glycine, proline, hydroxyproline and either leucine or isoleucine could be omitted with little change in growth. The remaining fifteen amino acids, alanine, valine, glutamic acid, aspartic acid, phenylalanine, tyrosine, threonine, methionine, tryptophane (LA an exception), cystine, serine, arginine, lysine and histidine are influential on acid production, though histidine is less effective than the others. This is the first case which has come to the authors' attention in which threonine is needed by bacteria.

Production of Trimethyleneglycol by Aerobacter aerogenes. M. N. Mickelson and C. H. Werkman, Bacteriology Section, Industrial Science Research Institute, Iowa State College, Ames.

Contrary to previous investigators, Aerobacter has been found to produce large yields of trimethyleneglycol from glycerol under anaerobic conditions in a glycerol mineral medium. Two strains of Aerobacter aerogenes and two unidentified species of Aerobacter were used. Yields of trimethyleneglycol in the neighborhood of 45 per cent of the fermented glycerol were obtained. Small amounts of acetylthiolcarbinol and considerable 2,3-butylene glycol were found. In this respect Aerobacter differed from similar fermentations by Citrobacter freundii where none of the latter products were found but some succinic acid was produced. Trimethyleneglycol production from glycerol cannot be used as a character to separate organisms of the intermediate colon types from Aerobacter.

Natural Distemper in Grey Foxes. C. A. Evans and R. G. Green, University of Minnesota.

During 1934 and 1935, an extensive outbreak of disease among wild grey foxes (Urocyon cinereoargenteus) occurred in southeastern Minnesota. Of thirteen foxes received, ten were studied for microscopic pathology, and the characteristic inclusion bodies of distemper were demonstrated in six. The other four were badly autolyzed. Cytoplasmic inclusion bodies were found in bile ducts, lymph node, adrenal, pancreatic ducts, and bladder. Intracellular inclusions, as is the rule in distemper, were less common than cytoplasmic, but were found in spleen, bile ducts, lymph node, adrenal pancreatic ducts, and salivary gland. All inclusion bodies appeared identical with those which characterize distemper in other animal species.

Paratyphoid (Salmonella sp.), a frequent secondary invader in cases of distemper in foxes on fox farms, was demonstrated in several of the grey foxes, including two with typical distemper inclusions. Pasteurella pseudotuberculosis was isolated from a fox in which both paratyphoid and distemper were also present.

Forty-five guinea pigs, six rabbits, and four quail were inoculated with material from the foxes, with essentially negative results. Four guinea pigs died of paratyphoid. Of four ferrets inoculated with tissue from three foxes, three died or were killed sick, but the presence of paratyphoid and of pseudotuberculosis makes these experiments of no more than confirmatory value in establishing the diagnosis of distemper.
Nonfatal Infections with Pasteurella tularensis in the Snowshoe Hare. J. F. Bell and R. G. Green, Department of Bacteriology and Immunology, University of Minnesota.

During an investigation of diseases of wild animals that has covered a period of eight successive years, tularemia has been studied in two species of rabbits, the snowshoe hare (Lepus americanus-phaeonotus) and the cottontail rabbit (Sylvilagus floridanus-mearnsi) on the Lake Alexander Area in Minnesota. Evidence has been adduced which indicates that the snowshoe hare, unlike the cottontail rabbit, is usually highly resistant to tularemia. The evidence is based on the epizootiology, pathology, immunology, and symptomatology of the disease in naturally infected snowshoe hares, and on characteristics of the organisms isolated from that species. In the period of the study, the incidence of infection in vectors of the disease became so great that cottontail rabbits on the Area were exterminated by tularemia; yet the snowshoe hares, which were more heavily infested by the vectors, did not suffer appreciable losses from this disease. In the snowshoe hares, tularemia usually was not acute, but was a symptomless infection characterized by chronic focal lesions. A high proportion of the hares trapped in winter possessed agglutinins for Pasteurella tularensis, an indication that they had recovered from infection with the organism. Strains of P. tularensis isolated from the snowshoe hare induced less acute infections in guinea pigs than did strains isolated from the susceptible cottontail rabbit.

Enzymic Variability of Aerobacter indologenes as a Function of Growth Conditions. C. R. Brewer, M. N. Mickelson and C. H. Werkman, Bacteriology Section, Iowa Agricultural Experiment Station, Ames.

Non-proliferating cell suspensions of Aerobacter indologenes grown on glucose in acid or alkaline buffer or on self-buffered citrate, possess enzyme systems which dissipilate other substrates to products resembling those of the "growth substrate." Pyruvic acid, a postulated intermediate compound, is fermented by "citrate" cells to give substantial yields of succinic acid with little 2,3-butylene glycol. Cell suspensions grown in acid glucose media dissipilate pyruvate to relatively high yields of the glycol and low quantities of succinic acid. These results conform to the normal dissimilation of glucose and citric acid.

A. indologenes cells grown on glucose in alkaline buffer or citrate, weakly attack glucose in acid buffer and form products normal to the dissimilation of alkaline glucose or citrate. Suspensions of cells grown in acid-buffered glucose dissipilate acid-buffered glucose to the normal products formed by growing cells. Alkaline glucose cells rapidly dissipilate glucose in alkaline buffer to the normal products of alkaline glucose fermentation by growing Aerobacter.

Suspensions of cells grown in alkaline-buffered glucose and in citrate are similar in enzymic activity. They are likewise similar in their growth metabolism. Acid glucose cells differ from both the above types in the activity of both growing and non-growing cells.

The Bacteriology of Perforation Peritonitis. Cora R. Owen, University of Minnesota, Minneapolis, Minnesota.

Guinea pigs were injected intraperitoneally with suspensions of the cecal contents of normal guinea pigs and
both the suspensions and the peritoneal cavities of the injected guinea pigs were cultured. Some of the suspensions were found to contain very few or no organisms of the coliform group and of the animals injected with this group of suspensions only 31% died, while 64% of the animals, injected with suspensions from which these organisms could be easily recovered, died. Members of this group of organisms were recovered from the peritoneal cavities of 84% of the guinea pigs which died of the injections and from only 16% of those which survived. It is concluded that the colon bacillus and related organisms are the most important pathogens in the intestines with regard to this condition.

Evidence for the Aerobic Decomposition of Lignin by Lake Bacteria. Janice Stadler and Claude E. ZoBell*, University of Wisconsin, Madison.

Concentrations of purified lignin as high as 0.5 per cent are not toxic for bacteria from Lake Mendota and other Wisconsin lakes. The larger bacterial populations found in water enriched with lignin suggest that it is slowly utilized by aerobic bacteria. It was found that each of eleven samples of lignin, differing in either the process of preparation or source, was oxidized by bacteria as indicated by oxygen consumption in closed bottles of water. As much as 3.07 mgm. of oxygen was used by bacteria in the presence of 5.0 mgm. of lignin in 30 days at 28°C. The oxygen consumption data indicate that from 2.1 to 33.2 per cent of the lignin is oxidized during this period of incubation. Lignin abiogenically absorbs a little oxygen from water but the quantity is very small as compared to the amount which is utilized when the water is inoculated with an enrichment culture of lignoclastic bacteria. Estimating the lignin by the acid-permanganate method it was found that 10 to 20 per cent of certain lignin samples were decomposed by bacteria under aerobic conditions.

The Effect of Oxygen Tension on Oxygen Consumption by Bacteria in Lake Water. Claude E. ZoBell* and Janice Stadler, University of Wisconsin, Madison.

The oxygen tension of water from Lake Mendota was adjusted at different levels ranging from 0.66 to 7.99 mgm./I. and stored in glass-stoppered bottles. Dissolved oxygen was determined at the beginning of the experiment and after varying periods of incubation at 25°C. From the results it is estimated that during the first 24-hour period an average of $78 \times 10^{-18}$ mgm. of oxygen was consumed per cell per hour, the amount being independent of the initial concentration of oxygen. Thereafter the rate of oxygen consumption dropped sharply probably due to the depletion of respirable organic matter but the rate was not influenced by the concentration of oxygen until the latter was exhausted. Similar experiments with resting cells in lake water enriched with organic matter confirmed the foregoing observations that the rate of respiration of certain lake bacteria is not a function of the oxygen tension of the water.

This conclusion applies to Serratia rubida and Flavobacterium flavus in pure culture as well as to the mixed microflora found in Lake Mendota.

*On sabbatical leave from the Scripps Institution of Oceanography, La Jolla, California.
THE EFFECT OF SALICYLIC ALDEHYDE ON THE INFECTION OF WHEAT BY PYTHIUM ARRHENOMANES DRECHSLER, AND THE DESTRUCTION OF THE ALDEHYDE BY ACTINOMYCETES ERYTHROPOLIS AND PENICILLIUM SP. V. E. Graham and L. Greenberg, University of Saskatchewan, Canada.

Salicylic aldehyde, when added to soil at the rate of 50 p.p.m., seems to predispose wheat roots to attack by parasitic strains of Pythium arrhenomanes.

Actinomycetes erythropolis and a species of Penicillium have been found in soil from the healthy area of a field partially infected with Browning root rot. These organisms caused the disappearance of salicylic aldehyde in an artificial medium.

It is suggested that lack of activity on the part of such organisms in certain areas of a field may lead to an accumulation of salicylic aldehyde or products acting in a similar manner, and that this may be a predisposing factor in the appearance of Browning root rot caused by Pythium arrhenomanes.

When Actinomycetes erythropolis and Pythium arrhenomanes are both added to sterile soil containing 50 p.p.m. of salicylic aldehyde under greenhouse conditions the harmful effect of the salicylic aldehyde is overcome.

CONCENTRATION OF POLIOMYELITIS VIRUS BY MEANS OF THE BEAMS CENTRIFUGE. Weldon C. White and Paul F. Clark, Univ. Wisconsin.

SOME EFFECTS OF STERILE INFLAMMATION ON EXPERIMENTAL POLIOMYELITIS. A. F. Rasmussen, Jr. and Paul F. Clark, Univ. Wisconsin.

A FERMENTATION CALORIMETER FOR THE STUDY OF HEAT EVOLUTION IN THE DECOMPOSITION OF PLANT MATERIALS. R. E. Carlyle and A. G. Norman, Department of Agronomy, Iowa State College.

There is little information about the phenomenon of heat evolution during the decomposition of plant materials and most measurements made up to the present have been confined to the determination of temperature rise. In an effort to make quantitative measurements an adiabatic fermentation calorimeter has been constructed. It consists of a vacuum flask capable of holding approximately 40 grams of material immersed in a bath the temperature of which is controlled by the temperature of the fermenting material inside. Two 2-junction thermopiles, one each in flask and bath, respectively, are connected directly to a galvanometer, the reflected beam from the mirror of which is focused on a photoelectric cell. Any deflection of the beam caused by an increase in temperature in the flask operates a relay switching on two knife heaters in the bath. The temperature in the flask is measured potentiometrically with a second thermocouple. The water equivalent of the calorimeter is determined by generating a known amount of heat electrically in a small resistance coil permanently in place in the calorimeter. Aeration is provided by passing air through a long copper coil in the bath and the air is saturated at that temperature by passage through a wet bead tower also immersed in the bath.
The Hydrolysis of Disodium Phenyl Phosphate by Gram-Negative Bacilli. Harold W. Leahy, Leslie A. Sandholzer and Marian R. Woodside, University of Rochester, School of Medicine and Dentistry, Rochester, New York.

It has been demonstrated for the first time that a wide variety of Gram-negative bacilli (Serratia, Pseudomonas, Escherichia, Aerobacter, Chromobacter, Proteus, Salmonella, Shigella, Eberthella and Alcaligenes) are able to hydrolyse disodium phenyl phosphate. The dephosphorylating activity was present in the bacterial cells, but was absent in Berkefeld filtrates and supernates of centrifuged cultures.

The optimal hydrogen-ion concentration was determined by suspending, in 10 ml. of 0.005 M substrate solution buffered with either phthalate or veronal to pH values between 4.0 and 9.0, a weighed amount (from 2 to 5 mg.) of lyophilized cells which had been grown on plain agar. The phenol that resulted from hydrolysis of the phosphoric acid ester was determined by using Gibb’s reagent (2,6-dibromoquinonechloroimide). All of the 23 organisms tested exhibited the presence of phosphatase. The optimal hydrogen-ion concentration, however, varied with the different genera and with different species in the same genus. The lowest optimum encountered was pH 5.8 and the highest pH 7.5. Under optimal conditions the maximal amount of phenol liberated was 1.12 mg. per mg. of dry cells in 24 hrs. at 37°C.

Fermentation of Carbohydrates by Strains of Commercial Yeasts. E. A. Beavens, N. Y. State Agricultural Experiment Station, Geneva.

Attempts to Apply Serological Grouping to the Non-hemolytic Streptococci. J. M. Sherman, C. F. Niven, Jr., and Karl Smiley, College of Agriculture, Cornell University, Ithaca.

Studies on Staphylococci of Animal Origin. W. B. Bell, Veterinary College, Cornell University, Ithaca.

The Nature of Viruses. George Packer Berry, University of Rochester, Rochester.


The desirability of a quick test to indicate to what extent nutrient elements (particularly K and P) in soil are available to plants is recognized. Various microorganisms have been suggested for this purpose on the assumption that they have nutrient requirements similar to higher plants while their period of growth is so short that results can be studied in the laboratory. Although each method has its advocates, results have always been open to question. It is difficult to evaluate such results, because to get any basis of comparison a soil must be studied over a series of years with various crops. The writer has tried...
unsuccessfully to use certain soil bacteria as test organisms, measuring their growth in soils by microscopic examination. It has been found that factors other than nutrient deficiencies (notably presence of colloids, and moisture level of the soil during the few weeks before the test is made) have had more effect on results than those that it had been desired to measure. These observations point to such great differences between the nutrient requirements of microorganisms and plants that it is doubtful if the former can be used to indicate deficiencies for the latter.

Protective Antibodies Effective against Type I Meningococcal Infection in Mice. Geoffrey Rake and Henry W. Scherp, Squibb Institute for Medical Research, New Brunswick, N. J. and Department of Bacteriology, University of Rochester School of Medicine and Dentistry, Rochester, New York.

A previous quantitative study of the precipitin reaction between a polysaccharide from Type I meningococcus and anti-meningococcal horse sera indicated that monovalent sera contained only homologous type-specific antibody, whereas polyvalent therapeutic sera contain in addition large amounts of group-specific antibody. These findings have been correlated with the protective capacity of the sera against Type I meningococcal infection in mice. Complete absorption of sera with Type I polysaccharide removed from 90 to 99 per cent of protective antibodies. Partial absorption of polyvalent sera was carried out in such a fashion that all of the type-specific antibody, but only from 30 to 60 per cent of the group-specific antibody, was removed. The residual antibody, which constituted from 30 to 40 per cent of the total precipitable antibody of the serum, had very slight protective capacity. One serum was encountered, in which about one-fourth of the protective antibodies was absorbable by an "agar-hapten."


The use of sulfapyridine for the treatment of gonococcal infections led us to investigate the bactericidal effects of the compound in vitro.

Forty strains of the gonococcus, isolated from various types of gonococcal infection, were used. Uniform suspensions in broth were prepared from the organisms grown for 24 hours on blood-glucose-ascitic fluid-agar slants. From each such suspension, 0.05 ml. was seeded into 1.5 ml. of blood-glucose-ascitic fluid broth containing enough sulfapyridine to yield a final concentration of 0.01 per cent (0.1 mg. per ml.). Control cultures without sulfapyridine were prepared in like manner. Serial subcultures were made on "chocolate" agar at 4-hour intervals for 48 hours, and incubated in 10 per cent CO₂ at 38°C. for 48 hours.

None of the strains was viable after 44 hours of exposure to sulfapyridine. One strain survived less than 4 hours, 2 failed to grow after 12 hours, 5 were non-viable after 16 hours, 10 after 20 hours, 9 after 24 hours, 9 after 28 hours, 2 after 32 hours, 1 after 36 hours, and 1 after 44 hours.

The 40 strains of the gonococcus were exposed in like manner to the same concentration of sulfanilamide, i.e., 0.01 per cent. A comparison of the two compounds showed that both were equally effective in killing 6 of the
strains. Twelve strains were rendered non-viable in a shorter period of time by sulfapyridine, and 22 more quickly by sulfanilamide.

WASHINGTON BRANCH

ARMS MEDICAL SCHOOL, WASHINGTON, D. C., MARCH 21, 1939


At a government-owned institutional dairy of about 250 cows, severe losses from dysentery in new born calves have occurred for a period of at least 12 years. During the first five and one-half months of 1938, 49 per cent of the new born calves died with acute dysentery before they were 5 days old. Cultures of Escherichia communior and Escherichia acidilactici were recovered from a large percentage of these calves that came to autopsy. A normal cow was hyper-immunized against these two cultures of bacteria and an immune serum prepared. Between June 15, 1938 and March 1, 1939, fifty-eight calves were treated with this serum. Of this total treated, four calves or 6.9 per cent died with dysentery. During the same period 65 calves were left untreated as controls. Fifteen control calves or 23.1 per cent died with acute dysentery. Colon-group bacteria were recovered from about 60 per cent of these calves that were autopsied.


WASHINGTON BRANCH

ARMS MEDICAL SCHOOL, WASHINGTON, D. C., APRIL 18, 1939

Organisms Invalidating the Diagnosis of Gonorrhea by the Smear Method. George C. DeBord, Health Department, District of Columbia.

Two undescribed Neisseria have been named. Neisseria fulva, from a case of conjunctivitis and vaginitis, has a waxy colony which does not adhere to the medium. The color is light tan, after mixing with a needle, a bright yellow. Acid is produced in glucose, fructose, maltose and sucrose. Neisseria gigantea, from a normal vagina, is a giant form with a waxy colony which can be moved over the medium with a needle. The colony is clear, becoming slightly opalescent with age. No sugars are fermented.

A new tribe, Mimeae, is proposed. The description follows: short rod, gram-negative, encapsulated, pleomorphic; growth on plain agar is abundant, white, glistening, smooth, viscid and the cells are almost wholly diplococcal in form, identical to the gonococcus in size and appearance; many cells retain the blue in Gram's stain in whole or in part; growth in broth is diffuse with a
viscid sediment with diplococci, rods and filaments present. Fermentation groups are (1) acid and gas from glucose, maltose, lactose with a few including sucrose, (2) acid only in glucose and maltose, (3) acid in glucose, (4) no sugars fermented. Motile and non-motile forms are found. Type species, *Mima polymorpha*, is a non-motile form from group four.

Approximately 30% of the total cases, normal and abnormal, showed organisms which might be mistaken for the gonococcus.

**The Morphological, Biochemical and Serological Properties of Bacillus pasteurianum and its Ability to Fix Atmospheric Nitrogen in Comparison with Other Anaerobic Bacilli.**

Howard L. Bodily, Department of Bacteriology, University of Maryland. (This investigation represents studies carried out by the writer at the Department of Bacteriology and Public Health, University of Colorado Medical School.)

The generic term *Bacillus* was used in preference to *Clostridium* because, in the writer's opinion, selection of generic terms should be based on the most stable traits of bacteria, i.e., morphology and staining characteristics and not on physiological differences. Ten strains received as *Clostridium pasteurianum*, three strains received as *Clostridium beijerinckii*, and one strain received as *Bacillus amylobacter* A. M. et Bredemann were subjected to morphological, biochemical, and serological studies. The results indicated that only one strain, of which a description follows, could be identified as *Bacillus pasteurianum*. Young vegetative rods were motile by means of peritrichous flagella and were gram-positive. Older cells developed into clostridia which, except for one pole, were stained violet brown by iodine. Later they bore oval sub-terminal spores which when mature were retained within the mother cell in a "spore capsule." *B. pasteurianum* fermented glucose, galactose, mannose, levulose, sucrose, maltose, raffinose, inulin, glycerol, mannitol, sorbitol, and inositol, but failed to ferment xylose, arabinose, rhamnose, lactose, starch, salicin, dulcitol, gum arabic, and cellulose.

In two per cent glucose tryptone mineral medium, *B. pasteurianum* produced butyric acid, and small amounts of butyl and ethyl alcohols but no acetone or isopropyl alcohol. It failed to liquefy gelatin, to blacken deep iron brain medium, to digest casein, to reduce nitrates, and to produce acrolein, acetyl-methyl carbinol, and indol. Pathogenicity was negative for rabbits and guinea pigs. Cross-agglutination tests showed that *B. pasteurianum* was serologically unrelated to all the other strains studied. In addition to the above, 22 other strains of anaerobic bacilli were tested for their ability to fix nitrogen in a Winogradsky's nitrogen-free medium. The results showed that *B. pasteurianum*, although not exclusive in its ability to fix nitrogen, was most active. It fermented 100% of the glucose and fixed from 4.5 to 4.6 mg. of nitrogen in 100 ml. of medium.