EVENTS

On Wednesday, January 15, Dr. F. d'Herelle presented before the Yale Chapter of Sigma Xi a paper dealing with "The Bacteriophage in Nature".

After discussing the general characters of bacteriophage, the speaker defined it as being possessing the characteristics of a particulate, filtrable, living bacterial organism.

In the study of normal infants between the ages of five and twelve days bacteriophage can be demonstrated as a normal constituent of the lower intestinal tract, where it persists throughout life. The appearance of the bacteriophage during convalescence, then, is not significant of the appearance of a new organism, but is evidence rather of the successful adaptation of an already existing element to the presence of new, infectious, invading agents.

The oral administration of viable cultures of bacteriophage has proved extremely successful in the control of epidemic infectious diseases, especially in limiting the epidemics of cholera in India.

—F. A. W.

Dr. Edward C. Schneider discussed "The Physiological Effects of Altitude" before the Yale Medical Society on January 22, 1930.

The chief physiological effect of altitude is that of anoxemia, due to the reduced partial pressure of oxygen in the atmospheric and alveolar air. This effect has been studied by means of aviators flying at high altitudes for short periods of time, by artificially producing high altitudes through the medium of low pressure chambers, and by results obtained from study of groups of people living at the top of Pike's Peak.

It was found in all cases that there is a compensatory change in the metabolism varying in each case as to rapidity of onset, duration, and extent, but, in the main, effecting the same end. In some people the metabolism was increased from the start and gives rise to the well-known mountain-sickness; in others it was decreased for some time and these individuals suffered very few ill effects from the reduced pressure.

The typical objective symptoms are drowsiness, loss of attention, fixation upon a single purpose, disturbance in judgment, and
finally loss of consciousness; this symptom-complex indicates that
the highest cortical centers are affected by the anoxemia. The phy-
siological adjustments compensating for the lowered oxygen ten-
sion are brought about by respiration, circulation, and the blood.
Some cases show no increase in the respiratory rate, but an increase
in the minute-volume; some demonstrate a decreased rate and
minute-volume, but an increased tidal air and a feeling of physical
betterment. This change in respiration often persisted for as long
as 15 days after a six months’ stay at the summit of Pike’s Peak.
The changes in the blood are those of an increased erythrocyte
count and increased hemoglobin, which is believed to be caused by
the liberation of cells stored in the spleen. This condition begins
to change almost simultaneously with the lowering of the pressure
and remains so for a period proportionate to the time spent at the
given altitude. The heart rate and the blood-pressure are increased
in most cases; coincident with the loss of consciousness a sudden fall
in the blood-pressure is noted. Due to the anoxemia there is an
increased alveolar air exchange with the resulting loss of carbon
dioxide from the blood, causing an alkalosis which is adjusted in
long stays at high altitude by the excretion of base by the kidney,
and in shorter sojourns by a subnormal respiration until the lost
carbon dioxide is replaced.

—D. N. B.

At a meeting of the Yale Medical Society, held on February 12,
the following papers were presented:

CUTANEOUS AND VENOUS BLOOD-SUGAR DETERMINATIONS IN
DIABETIC ACIDOSIS

RICHARD P. STETSON, M.D.

The data presented were obtained from the study of cases of
diabetic acidosis under treatment. Most of the cases showed evi-
dence of activity on the part of the muscles in removing glucose
from the blood, as evinced by a higher concentration of sugar in the
arterial than in the venous blood. This was less apparent at the
lower concentrations of blood sugar. Most of the cases at some
time in their course showed a venous sugar concentration higher
than the arterial. Possible explanations of this negative difference
are: an increased rate of glycogenesis by the liver with removal
of blood sugar from the blood stream, or, an increased rate of glucose excretion by the kidneys. —F. B. W.

CHANGES IN THE SERUM ELECTROLYTES IN DIABETIC ACIDOSIS UNDER TREATMENT
DAVID M. KYDD, M.D.

If the blood of a patient in severe acidosis is examined before treatment has been begun, there is found a marked reduction of total base, bicarbonate, and chloride, and an increase in the organic acids. Serum proteins also are decreased, and the blood is decidedly concentrated, probably due to dehydration. As recovery takes place there occurs a gradual accumulation of bicarbonate and a decrease in the organic acids, but even where the patient is markedly improved there is still a depletion of total base and chloride. The serum proteins, however, during this period of recovery, continue to decrease; the concentration often becoming so low that peripheral edema is produced.

Blood sugar levels do not necessarily indicate the state of the patient as determined by electrolytic changes, for many severe acidoses were found to be accompanied by only moderately elevated blood sugar levels, and conversely, a patient was studied who had a blood sugar level approaching 600 milligrams per cent and yet showed no evidence of acidosis beyond a slightly lowered chloride and total base. It was demonstrated that, as a rule, there is an inverse ratio between the amount of organic acid in the blood and the amount of acetone excreted in the urine. Treatment in these cases of diabetic acidosis is aimed to restore the depletion of total base, chloride, and bicarbonate as speedily as possible. This series, as yet far from complete, will be continued to show the effect of the administration of varying proportions of salt, water, insulin, and carbohydrate on the electrolyte changes of the blood. —F. B. W.

EFFECTS OF WATER DEPRIVATION ON THE MOTILITY OF THE EMPTY STOMACH: STUDIES ON DOGS
GEORGE R. COWGILL, PH.D., WILLIAM B. ROSE, PH.D., CHARLES J. STUCKY, PH.D., AND LAFAYETTE B. MENDEL, PH.D.

In a series of studies on dogs it was found that the deprivation of water caused an increase in the homoglobin content, a derangement of
rhythm of the gastric contractions, a cessation of hunger contrac-
tions, and after a six-day period of water deprivation there was
pronounced gastric atony and almost complete cessation of mo-
tility. When water was supplied to the animals at the end of the
six-day period there was an almost immediate return to the nor-
mal state.

—A. A. E.

SPREAD OF RHEUMATIC FEVER THROUGH FAMILIES
JOHN R. PAUL, M.D., AND ROBERT SALINGER, M.D.

The studies were made on 11 families under observation in the
New Haven Hospital, and the following conclusions were drawn
from the statistics obtained.

1. The appearance of infectious rheumatic fever in one mem-
ber of a family was generally concomitant with the appearance of
the same symptoms in another.

2. Along with the symptoms of rheumatic fever there were
generally unexplained appearances of bronchitis, pertussis, etc.

3. The younger children in the family are more susceptible
to the infectious rheumatic fevers.

—A. A. E.

INFLUENCE OF RACE STOCK UPON THE INCREASING DEATH RATE IN ADULT LIFE
CHARLES-EDWARD A. WINSLOW, DR. P.H., AND PAO LO WANG, M.A.

The conclusions drawn from these statistical studies show that
the death rate is higher among the foreign-born than among the
native-born of native parentage or of foreign parentage, and that
the death rate doubles itself for each decade of life above fifty
years of age.

—A. A. E.

The winter meeting of the Connecticut Branch of the Society
of American Bacteriologists was held on February 14, in the Brady
Memorial Laboratory Auditorium. The following are abstracts
of the papers presented:

THE BACTERIOPHAGY OF A SPORE-FORMING ORGANISM
P. B. COWLES

The isolation of a race of bacteriophage active for the spore-
forming B. megatherium is reported. While highly potent in
effecting the dissolution of the vegetative form of the bacillus, the spores appear to be completely refractory. Because of the large size of the cells of *B. megatherium* the process of bacteriophagy can be easily observed under the microscope; such observations indicate that with cultures of this type the usual process of swelling which precedes dissolution is lacking. —H. M.

**FILTER-PASSING FORMS OF CORYNEBACTERIUM DIPHTHERIAE**

**GEORGE H. SMITH AND ELIZABETH JORDAN**

Filtrates of cultures of *C. diphtheriae* which had been maintained under adverse conditions eventually developed a turbidity, which was not referable to the presence of definite morphological forms. When, however, these filtrates were subjected to serial transfer, visible colony formation developed. The cultures obtained exhibited various stages of bacterial cyclogeny, and the strains ultimately developed possessed the attributes, other than virulence, of *C. diphtheriae* or the diphtheroids. This development of filter-passing forms in such cultures can not be directly correlated with the morphological type, virulence, or toxigenic power of the parent strains. —H. M.

**ON THE SEROLOGICAL DIAGNOSIS OF PULLORUM DISEASES: THE CAUSE, MECHANISM AND ELIMINATION OF CLOUDY REACTION**

**GEORGE VALLEY AND E. P. CASMAN**

When the sera of certain chicks are placed in agglutination tubes, cloudiness appears in the tubes. This clouding reaction interferes with agglutination, but the opalescence may be dispersed by raising the pH. Extracts of the cloudy precipitate give the biuret and xanthoproteic reactions. Although a part of the precipitate dissolves in acetic acid, lecithin, rather than the amount of protein or serum, seems to be the essential constituent. The high fat content of the serum may be due to excitement or exertion.

—F. A. W.
AN AERATION TRAIN FOR THE STUDY OF GASES PRODUCED IN BACTERIAL GROWTH

HAROLD H. WALKER

Salt solutions in certain concentrations increase the growth of bacteria. This increase in growth may be determined by measuring the volumes of carbon dioxide and ammonia given off during the course of growth. An ingenious aeration train for the measurement of such gases was described. The distinctive feature of this aeration train is that it permits of a simultaneous determination of both gases.

—F. A. W.

Dr. John F. Erdman of the Post-Graduate Hospital, New York City, addressed the New Haven Medical Society on February 5, 1930. In his paper Dr. Erdman discussed the cause and treatment, as well as the prevention, of post-operative abdominal fistulae and sinus tracts.

Fistulae of the gall-bladder are considered the most common and are caused either by failure to remove the gall-bladder at the time of the operation and drainage over too long a period, or else by the failure to remove all foreign bodies from the operative site. Frequently following cholecystotomy a stone will occlude the common duct and result in a permanent fistula in the abdominal wall. Sponges and pieces of rubber from patched gloves or Penrose sheaths are also found to be the cause of delayed healing of the wound. Prevention is accomplished by removing the gall-bladder at the time of the operation and by removing all drains by the third post-operative day, precautions which should be supplemented by the most thorough and careful surgical technic. Treatment of long-standing fistulae of the biliary system consists in resecting the sinus tract, removing the gall-bladder and its ducts, and anastomosing the ampulla of the hepatic duct to the duodenum over a small rubber catheter, which in time will probably be passed per rectum. If the catheter is not passed a secondary operation for the removal of the tube may be necessary.

Next in frequency come appendiceal fistulae. These are caused, as mentioned above, either by foreign bodies in the wound or by long-sustained drainage. The speaker believes that all cases of gangrene or abscess in the region of the appendix should be treated
by appendectomy and short drainage, without inversion of the stump or the use of non-absorbable sutures. Treatment of fistulæ in this group consists of dissection of the tract to the cecum and complete removal of the fistula. If caused by a foreign body, simple removal of the offender will result in a cure.

Fistulous openings from the intestinal tract are usually multiple and are caused either by operative trauma or by some of the aforementioned factors. Treatment consists in a fairly extensive resection of the gut. The prognosis here is rather less favorable than in the preceding groups.

In a few cases of pancreatic fistulæ successful cures were obtained by coring out the sinus, dissecting it back to the pancreas and anastomosing the distal end to the posterior wall of the stomach.

In summarizing his remarks, Dr. Erdman concluded that all fistulæ of the abdomen are caused either by prolonged drainage of acute processes, by foreign bodies in the wound, by the use of non-absorbable suture material, by indiscreet manipulation of tissues at operation, or by ignorance on the part of the operator. Prevention of such fistulæ demands that all abdominal surgery be thorough and radical, that care be taken to cause as little trauma to tissues as is possible, and that the wound be carefully inspected before closure and all foreign bodies removed.

On February 19, 1930, Dr. W. P. Graves, Professor of Gynecology in the Harvard Medical School, addressed the New Haven Medical Society on the subject “Uterine Bleeding of the Menopause”.

Increased uterine bleeding during the fifth decade of life may be due to organic changes in the uterus such as carcinoma, endometriosis, chronic cervicitis, and uterine fibroids, or to functional changes in the uterus where the bleeding results from some disturbed physiological uterine function.

Increased functional bleeding during the period of the menopause is not a normal manifestation of the change of life. Many theories have been advanced to explain the cause of this so-called functional bleeding, of which the most outstanding of the older ideas is that the bleeding is due to a chronic endometritis of bacterial origin. A radical curettage was therefore the popular method of treating such cases. However, when it was learned that the en-
dometrium is hardly ever chronically infected, due to the fact that it is periodically shed and renewed, this idea was for the most part abandoned. The modern conception is that such bleeding is not due to any change in the endometrium primarily, but to a disturbance of the function of the ovary. Just as typical, menstrual, uterine bleeding is a result of normal functioning of the ovary, so is atypical, abnormal, uterine bleeding a result of atypical and abnormal ovarian function.

This disturbed ovarian function is manifested anatomically by a failure of the Graafian follicle to rupture. The persistence of the Graafian follicle and, therefore, the absence of the corpus luteum, result in unusual changes in the endometrium. Instead of the usual serrated, saw-like glandular structures that are found in the endometrium in the secretory stage of the menstrual cycle, there is now a "dysplasia" of the endometrial glands and they assume bizarre shapes and sizes. It is this "dysplasia" that is responsible for the atypical, excessive, functional, uterine bleeding.

Since such uterine bleeding is not associated with any anatomical change in the uterus, but rather with a change in the function of the ovary, all attempts at treatment should be directed toward the ovaries and not to the uterine mucosa. Curettage is obviously of no value. Treatment of the ovaries may be divided into two groups: 1) removal of the ovarian function by surgical interference or by radiation with radium; 2) administration of ovarian hormone. Surgical intervention and irradiation have both proved to be of definite value in such atypical uterine bleeding. The value of ovarian hormone has not been as yet definitely established. —M. T.