patient reeled and complained of pain in the back when walking. He was very weak. Temperature was normal. The patient had at this time no cough or expectoration. Tuberculin tests were negative.

The blood showed hemoglobin, 20 per cent. (Dare); reds, 1,284,000; whites, 19,000. Stained specimens showed some poikilocytosis. No megalocytes were present, although there was some anisocytosis. Most of the cells looked small. Many normoblasts and some megaloblasts were seen, the latter showing all degrees of polychromatophilia. Some were absolutely basophilic.

A differential count showed polynuclears 23.5 per cent., small lymphocytes 50 per cent., large lymphocytes and transitionals and large mononuclears 21.5 per cent., eosinophils 3 per cent., basophils 2 per cent. For each 100 white cells there were sixteen nucleated reds, thus giving 3,040 nucleated red cells per cubic millimeter. Of these about 75 per cent. were normoblasts and 25 per cent. megaloblasts.

Several careful examinations of the patient's blood were made at intervals, but no marked change from this description occurred.

It was noted that the patient was passing large amounts of urine, a symptom of which he had complained, and on measuring, it was found to amount to about 2,000 c.c. daily. This was usually slightly cloudy, very pale, for the first week or ten days of observation slightly greenish in color, later becoming pale yellow. Its specific gravity was always about 1.008. It was very slightly acid in reaction. No serum albumin or sugar was present. When heated to about 56 C., however, it became opaque with the formation of a flocculent precipitate. This could be dissolved by the addition of acetic acid; if heated to the boiling point, it almost cleared, to again become very cloudy on cooling. When measured with an Esbach albuminometer this albumose was found to amount to 2 gm. to the liter. This Bence-Jones body varied considerably in amount, but was never absent from the urine during the remaining life of the patient, usually from 1 to 2 gm. to the liter. The urine was also found to contain enormous amounts of indican, and as the taking of methylene blue or other drugs, which might cause the urine to become green, could be absolutely eliminated, the color was supposed to be caused by the excessive excretion of this substance. It also blackened the precipitate of albumose on boiling. After passing the urine through the centrifuge a few hyaline casts could usually be found. After the discovery of the Bence-Jones body a very careful examination of the patient's bones was made, but nothing whatever could be detected, except a slight tenderness on percussion over the lower part of the sternum.

This condition continued without much change, except ever-increasing weakness, until the patient's death on July 28, due to his extreme anemia.

Necropsy.—This was performed nine hours after death. It revealed an emaciated man, about 60 years of age, 5 feet 10 inches tall, weighing about 125 pounds. There was no livor of the dependent parts. The superficial fat was not well retained. The cutaneous surfaces were very pale, but not jaundiced. The muscles of the abdomen and thorax were apparently normal. The cut surfaces of the costal cartilages appeared much whiter than usual. The sternum proved very fragile, and was broken twice in the attempt to remove it. There were slight recent adhesions in the right pleural cavity, but no fluid. The left pleural cavity was normal, as were also the lungs, with the exception of some hypostatic congestion at the bases. When the lungs were raised out of the chest the ribs were noted to have a wavy surface, caused by masses varying the size of from a pea to that of an almond. These masses were present on practically every rib, and looked as though the cortex had been bulged out in spots. The cortex was not broken anywhere. The ribs were very fragile and easily broken, and the sternum and ribs were easily cut through, showing a wavy outline, with the cortex very much thinned, and the medullary portion made up of a soft, moist, dark red tissue. This was continuous throughout the sternum, but alternating in the ribs with areas of grayish marrow, into which the reddish tissue insensibly merged. Examination of the right femur showed it to be normal. The bodies of the vertebrae

were not sawn through, nor was the skull-cap removed. The pericardium was normal. The heart was normal in size, with normal endocardium and valves. The myocardium, however, showed fatty degeneration.

The liver was much enlarged, reaching almost to the level of the umbilicus. The gall-bladder was distended and fixed by firm adhesions to the liver. It could be emptied into the bowel by gentle pressure. No stones were present.

The mesentery of the transverse colon was firmly adherent to the under surface of the liver. On section, the liver was softer and paler than normal.

The spleen, which was very soft, measured 8 by 5½ by 2¼ inches, and weighed about 3¼ pounds, and had the appearance of a leukemic spleen.

The small intestines seemed very much contracted. No abnormalities were noted in their walls, and no ulcerations were present. With the exception of fatty degenerative changes, all the other abdominal organs were normal. None of the lymph-glands of the body were enlarged.

A section of rib, examined by Dr. Stanley P. Black, revealed the histologic structure to be practically that described by Christian.

AN EMERGENCY CULTURE MEDIUM FOR USE IN PRACTICE

FRANK M. WOOD, M.D.
CHICAGO

In general practice there are repeated demands for a culture medium which is, at the same time, cheap and easily prepared from the materials at hand. This is especially true when the physician desires to grow bacteria for the preparation of bacterial vaccines. The usual culture media are expensive and difficult to obtain, the apparatus necessary for their preparation is extensive, and the technic of preparation is long and tedious. Therefore, the demand for a special emergency medium is great.

Bacteria grow on ordinary artificial media under unnatural conditions and their character is often quickly changed by the new ingredients of the media. Some species cannot be grown without special care; this is true of the pneumococcus, the streptococcus and the gonococcus. These cocci do not grow readily; it is difficult to keep them alive, and their virulence is often lost after two days' culture, unless they are surrounded by the nourishment afforded by human secretions. The problem is to supply them with conditions as nearly as possible like those which they find in the human subject.

I experimented for several years with agar-agar, Loeffler's blood-serum, bouillon, milk and potato, and noted the effects of various salts and chemicals in solution on the growth of bacteria. I also followed the experimental work done in the physiologic laboratories: the use of normal salt solution to preserve skin grafts; the work of Dr. Loeb at the University of Chicago with amebas in salt solution; the power of salt solution to preserve the life of the cells in the blood-vessels and heart of the frog, and finally the suspension of the leukocytes in normal saline solution in performing the various experiments in determining the opsonic index. These studies led me to think that normal salt solution might keep bacteria alive. I found that if sufficient material from the site of the infection were added to 2 drams of normal salt solution, in a sterile bottle or test-tube, and incubated at body temperature, many of the ordinary bacteria could be grown and kept alive for weeks and even months, and that in some strains the virulence seemed to be maintained longer than when grown on the ordinary media.

This method can be used to transfer culture material from the office of the general practitioner to his laboratory or to that of the laboratory specialist, and will be found of distinct advantage in transporting infectious material over long distances. All that is needed is a sterile bottle containing sterile, normal salt solution, in which is suspended some of the discharge from the point of infection, the discharge having been obtained under aseptic precautions. It is important to obtain a liberal amount of the material from the site of infection, in order to furnish the infecting bacteria with sufficient provender.

There are some exceptions among bacteria; some will not grow in salt solution, and doubtless others will be found. Pneumococci can be kept alive in it only a very short time, and are completely dissolved (autolyzed) in four days, as noted by Rosenow. Streptococci do not grow well unless serum from the site of the infection be added, but this can easily be done. Staphylococci, *Bacillus typhosus*, *Bacillus coli communis* and *Bacillus pyocyaneus* can be readily grown. The gonococcus can be grown in salt solution by the addition of a liberal supply of human blood to a free supply of secretion from the infecting area. Diphtheria bacilli grow with difficulty, but can be grown in salt solution by the addition of a few drops of human blood-serum or sterile beef bouillon.

It will be noted that all these materials may be obtained at home and with but little trouble and expense. The tubes of cultures thus obtained may be incubated on the person of the doctor or of the patient, care being taken to see that they are well stoppered by stoppers rendered sterile by boiling or steam sterilization.

I offer this preliminary report to those who are interested in bacteriologic work and especially to workers in vaccine therapy, as a ready assistance in such work, with the desire that it may save both time and expense.

34 Washington Street.

SYSTEMIC BLASTOMYCOSIS

REPORT OF A CASE

ROBERT G. WASHBURN, B.S., M.D.

Associate Professor of Dermatology, Marquette University;
Dermatologist to Milwaukee County Hospital

MILWAUKEE, WIS.

During the last decade, blastomycosis cutis has become a well-recognized, distinct, clinical and pathologic entity among dermatologists. Although it is not a common disease, it appears to occur more frequently in this vicinity than it does elsewhere. More cases have been reported from Chicago than from any other one locality, and it is largely to the thorough work of our Chicago confrères that we are indebted for our present knowledge of the disease. Prior to the work of Gilchrist and Stokes in 1896, the disease was mistaken for various other conditions that resemble it in certain respects. The three diseases which have given rise to most difficulty in diagnosis are tuberculosis, syphilis and carcinoma. Blastomycosis resembles very closely the verrucous form of tuberculosis and often a definite diagnosis can only be arrived at after microscopic examination of the tissues or the pus. The lesions of blastomycosis resemble somewhat those of the rarer vegetating forms of syphilis, and if the diagnosis is not established by microscopic examination, the clearing of the lesions under potassium iodid may still further confuse the physician. The resemblance

of the lesions to carcinoma is only very superficial and should lead to no difficulty if the history of the case is carefully gone into.

The organism which gives rise to this disease is a fungus much resembling yeast. It is very readily demonstrated in the pus from the lesions by treating the material with liquor potassæ and examining under the microscope with a fairly high power. The organisms resist the action of the alkali and are thus easily distinguished from epithelial cells and pus cells. They are round, oval or slightly irregular in outline and have a well-defined double-contoured homogeneous capsule. The protoplasm is finely or coarsely granular and is separated from the capsule by a clear space of varying width. Budding forms are seen in all stages. No mycelium has as yet been demonstrated in the pus from skin lesions or deeper abscesses, but it is seen in cultures. The organisms grow very readily on artificial media.

The typical skin lesion is so characteristic that to one familiar with the disease, the diagnosis, as a rule, presents very little difficulty. The lesions are elevated from the surface; each has a well-defined border and is covered with irregular papillary elevations, separated by clefts or fissures, giving the whole a verrucous appearance. Portions of the surface are covered by crusts. The border is the most characteristic feature. It slopes abruptly to the normal skin and on close inspection it is seen to be set with a large number of minute abscesses. The pus from these abscesses contains the blastomycetes in large numbers.

The first case of blastomycosis to be recognized was one of systemic infection with the organism reported by Busse and Buschke in 1894. Credit belongs to Gilchrist and Stokes, however, for first describing the typical cutaneous lesions and properly classifying the parasite. Since these reports, a hundred cases or more have been recorded and no doubt many hundreds of cases have been recognized and treated which have not found their way into medical literature.

Recently a number of cases of systemic infection with the organism of blastomycosis have been reported. There are now on record twenty-nine in all; reports of twenty-seven of these were collected and published in a very exhaustive article two years ago by Montgomery and Ormsby. Since that time, one case, the first from the South, has been reported from Memphis, Tennessee, by Fontaine, Haase and Mitchell; and another case has been recorded by Hutchins. To this list I wish to add still another which has recently come under my observation at the Milwaukee County Hospital and which I was able to follow and study with the assistance of Dr. L. M. Warfield.

REPORT OF CASE

The patient was a German laborer, aged 70, who had resided in this country thirty-seven years and had been an inmate of the Milwaukee County Almshouse for four and one-half years. He was first admitted to the County Hospital March 1, 1909, on account of a sore on his right elbow. There was nothing of importance in his past history; he had had typhoid fever, but denied any knowledge of venereal infection.

The present illness dated from three weeks before his admission to the hospital. After a slight trauma, a lesion developed on his elbow. On admission, this lesion was about the size of a silver dollar and presented a purulent granulating surface, with a well-defined margin and somewhat raised above the surrounding skin. This lesion was on the right arm, just over the internal condyle of the humerus. The tissues surrounding this ulcer were edematous. The patient also presented at this time (March 19, 1909) over the vertex of the skull a soft, well-defined mass about the size of a hickory-nut. This was incised