agulative necrosis. Gabritschewski¹³ is inclined to believe that these elements are rather young than degenerate forms, from the fact that he has found certain nucleated red corpuscles which show this same characteristic stain. Ehrlich, however, remarks that this is only true of the nucleated red corpuscles of the second class, the gigantoblasts, particularly those in which the nucleus is fragmented. He asserts, moreover, that corpuscles with affinity for basic stains may be found in the blood of acute anæmies before regenerative forms appear, while they are found in considerable numbers in the blood of starving animals where there is no sign of regeneration. They are clinically, of course, found in association with what we consider regenerative forms (nucleated red corpuscles). Ehrlich well speaks of "Der haupt Charaktere des anæmischen Blutes, das Ineinandergreifen von degenerations und regenerations Formen."

(II) The colorless corpuscles. With stained specimens information can readily be gained with regard to the number and the varieties of the colorless elements. There is no method by which so careful a differential analysis can be made. The occurrence of a leucocytosis can be made out almost as satisfactorily by the practised eye as by counting the corpuscles. Under the term leucocytosis I shall understand, in the sense of Ehrlich, an increase in the total number of leucocytes where the differential count shows only a marked increase in the percentage of the multinuclear neutrophils at the expense of the small mononuclear leucocytes.

(To be continued.)

AMPUTATION AT THE HIP-JOINT FOR ANGIO-SARCOMA OF THE THIGH.

BY HOMER GAGE, M.D.,

Surgeon to Worcester City Hospital and to Memorial Hospital.

THE following case is interesting simply as a case of successful amputation at the hip-joint, but it possesses an additional interest from the very unusual character of the new growth for which the operation was performed.

F. F., a boy, thirteen years old, entered my service at the Worcester City Hospital on November 24, 1890, for a tumor of the left thigh. His father had had three small tumors removed from his leg at different times, the nature of which I was unable to ascertain; otherwise the family history was good. There was no history of previous illness, although the boy had never been very robust.

About four months prior to entrance, while in the act of bowling a croquet-ball, he turned his left leg outwards rather violently, wrenching the upper part of the left thigh. A few hours afterwards the thigh became "stiff" and painful, and it hurt him to walk. On the next day it was noticed that the upper part of the thigh was swollen. It continued swollen and painful until about one month later, when he says the swelling seemed to diminish under the use of tincture of iodine. But it very soon began to grow again, and during the past week or two has increased very rapidly. He was very pale and thin, and was able to get about only with great difficulty.

The upper third of the left thigh presented a cylin-

drical swelling, situated chiefly upon the anterior and inner aspect. It was apparently not connected with the bone, was fluctuating in front, hard beneath, non-pulsating, and moderately tender. During the next four days the skin over the swelling became very tense and glistening. His temperature ranged from 100° to 101° and his pulse from 110 to 120.

On November 28th, I made an incision on the anterior surface of the tumor two inches long. Upon the introduction of the finger, a soft, friable mass was encountered in every direction, and a substance resembling disintegrated blood-clot, some of which seemed to have a laminated structure, escaped in great quantities. A second incision was then made parallel to the first (in the long axis of the thigh), about four inches long, over the centre of the tumor, exposing a mass similar to that just described. Large quantities of clots and soft disintegrating tissue were scooped out, after which

FIG. 1.

the finger was easily worked up nearly to and beneath Poupart's ligament. Amputation at the hip-joint was decided upon as the only possible means of removing the tumor, and in order to insure the loss of as little blood as possible, the external iliac artery was quickly tied just above Poupart's ligament. The limb was then disarticulated and the stump covered with lateral skin flaps. The adductor group of muscles clear to their point of origin presented a gelatinous appearance, evidently the result of beginning infiltration, and they were accordingly removed as thoroughly as possible with the scissors.

Figure 2 represents very clearly the amount of tissue involved in the tumor. The four muscles which form the inner hamstring are seen on the right, dissected off and turned downwards (*a, a, a, a*). Between them and the belly of the biceps is the great sciatic nerve (*b*). Above the tumor lies the femur (*d*), exposed by lifting off the quadriceps extensor, and a canula is to be seen inserted into the femoral artery. None of these structures were in any way involved in

¹³ Archiv. f. Experimentelle Pathologie u. Pharmacol., 28 B; 1, 2, 11; p. 83.

the tumor, which is seen to be confined entirely to the group of adductors (*e*).

The hemorrhage was almost *nil*, but the shock was so great that during the latter part of the operation his pulse became very feeble and rose to 180. In order to try its effect in a case of simple shock, Dr. S. B. Woodward, who kindly assisted me at the operation, injected, at my request, twenty ounces of normal salt solution into the median cephalic vein of the right side. The pulse fell at once to 150, of increased strength, and although it rose during the afternoon to 170, on the following morning it had come down to 140. Nourishment and stimulants were freely administered, and he began slowly to regain his strength. The temperature, which had risen as high as 102°, remained normal after the fifth day; and on the seventh primary union of the wound, except along the track of the drainage-tube, was complete. He continued to

large soft mass confined to the adductor muscles. The centre of this mass was composed of broken-down coagula, around which was a layer of soft, round-celled sarcomatous tissue containing numerous anastomosing blood-vessels. Diagnosis: angio-sarcoma.

Clinical Department.

A CASE OF HEMIANOPSIA.

BY CHARLES M. HOLMES, M.D., NORTHAMPTON.

MR. H. R., was wounded through the head by a rifle-ball when fourteen years of age, forty-five years ago. In passing an open window through which some men were firing at a target, his head intercepted a bullet which struck him in the right temporal region, at a point three-fourths of an inch in front of a vertical line from the right external auditory canal and two inches above the level of the same point. The bullet passed through the head in a backward and slightly upward direction, and came out in the median line three inches above the external occipital protuberance of the occipital bone, the distance between the entrance and exit measured on the convexity of the skull being seven inches.

At the point of entrance the wound was apparently but little larger than the bullet which caused it, and this point is now marked by a slight but distinct bony prominence. The damage to the skull was greater at the point of exit, where two fragments of bone as large as a "finger-nail" were removed by the attending physician, Dr. Rice, of Leverett, Mass., deceased. The patient says that these pieces of bone were preserved for many years, and he has often seen them. This wound is marked by a large pit in the scalp. This spot is very sensitive to pressure at times, and the patient says that a very slight blow there will cause a convulsion. According to the statement of the patient, Dr. Rice told him afterward that he saw on the grass "several spoonfuls of white brain substance lying there in the clotted blood."

Loss of consciousness was immediate, and no one expected that he would live. After a hard struggle of six months he was again able to get about; but he was hemiplegic, and this condition has remained, though he now has some use

of his left leg, and can walk with the aid of a cane if he uses great care and keeps on a level and smooth surface.

The whole left side shows the results of the injury. He had so nearly attained his growth in height at the time of the accident that there is little if any difference in the comparative lengths of the long bones of the body; but there is a difference of from half an inch to two inches in the girths of the two sides, on account of failure in development and also on account of atrophy from disuse of the left side necessitated by the paresis of that side.

His tongue is not markedly affected, though he says he cannot manage his food so well if it is chewed in the left side of his mouth. Sensation is dulled on the whole left side of the body, though there is no complete anæsthesia. The left side feels numb and cold, especially if he is tired. The senses of taste and smell are impaired on the left side. Hearing is also a little im-

FIG. 2.
a, a, a, Inner hamstring muscles. b, Sciatic nerve. c, Biceps femoris. d, Head of femur. e, Tumor.

improve steadily, was up on crutches; and on January 12th, six weeks after the operation, was reported to be gaining both strength and flesh. On the following day, however, the inner part of the stump became red, hard, oedematous and painful. It was manifestly a recurrence, but seemed to be limited to a small movable nodule, and its removal was therefore attempted by my successor at the hospital, Dr. S. B. Woodward. The whole stump proved to be infiltrated with soft broken-down material, similar to that found at the first operation, and the disease had extended round on to the buttock and involved the gluteal muscles. Everything possible was removed, but recurrence was noted again two weeks later. He gained temporarily in strength, left the hospital in February, and died at home the last week in March, eight months after the receipt of the original injury.

The examination of the tumor by Dr. W. S. Miller, the hospital pathologist, showed that it consisted of a