border. There was a foul discharge from the right ear. The blood showed: Hemoglobin, 25 per cent.; red corpuscles, 1,272,000; white corpuscles, 6,600; small mononuclears, 38 per cent.; and large mononuclears, 15 per cent.—3,498; polynuclear neutrophils, 42 per cent.—2,772; eosinophiles, 3 per cent.; mast cells, 2 per cent. There was marked achromia, some polychromatophilia, and considerable variation in the size and shape of the red cells. Six normoblasts and three megaloblasts were seen for each 100 white cells. The platelets were not noted.

The low white count and the absolute diminution in the number of polynuclear cells are noteworthy. It is also noteworthy that the bone-marrow is attempting to regenerate the red cells.

Under treatment and after the removal of the tonsils, he improved in every way, and the glands, liver and spleen diminished in size, although the ear continued to discharge. The blood improved markedly in every way, but there was never any leukocytosis. He returned four months later, covered with large and small purpuric spots and bleeding from the gums. The cervical lymph nodes were much enlarged; the liver was palpable 5 cm. and the spleen 6½ cm. below the costal border. The examination of the blood was incomplete, but it contained 43 per cent. of hemoglobin, 2,992,000 red corpuscles and 29,000 white cells, 85 per cent. of which were mononuclears. He was transfused, but continued to bleed for a month, when he stopped. The glands in the neck were very large, his ear discharged freely, the wound in the neck made for the transfusion was open and septic, and he had difficulty in breathing. He was then taken from the hospital against advice. His blood at that time showed: Hemoglobin, 32 per cent.; red corpuscles, 1,688,000; white corpuscles, 2,800; small mononuclears, 82.5 per cent., and large mononuclears, 3 per cent.—2,349; transitionals, 2.5 per cent.; polynuclear neutrophils, 10.5 per cent.—294; eosinophiles, 0.5 per cent.; basophiles, 1 per cent. There was marked achromia, but no nucleated red cells. No platelets were seen.

After his return home a retropharyngeal abscess apparently ruptured and drained into the throat. He had many abscesses in various parts of the body, which were opened and drained. He gradually recovered. He is now nine years old, and, according to his physician, perfectly well, although his blood has not been examined. Interesting points in this case are that it shows that infection can so greatly depress the productive powers of the bone-marrow and thus bring on a blood picture materially different from that usually seen in infections. It suggests the possibility that an infection or intoxication may be at the root of the severe anemias which we have been con-

sidering, even though there is no evidence of any source of infection or intoxication.

SUMMARY.

Myelogenous leukemia is a most unusual condition in childhood. Lymphatic leukemia is uncommon, but occurs much more frequently than the myelogenous type. More common than either is a very severe and rapidly fatal type of anemia, in which there is a most profound depression of all the functions of the bone-marrow. In certain instances there may be associated with it an increase in the productiveness of the lymphatic organs. The line between this condition and lymphatic leukemia is at times somewhat indistinct. It strongly resembles, if it is not identical with, the aplastic anemia of adults. Its relation to the purpuras can only be determined by more careful study by modern methods. Its etiology is not evident, but analogy suggests that it may be the result of some intoxication or infection. The ordinary type of pernicious anemia of adults is extremely rare in childhood.

REPORT OF PROGRESS IN ORTHOPÆDIC SURGERY.

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THIS report is based upon the "Report of Progress in Orthopædic Surgery," as published in the *Archives of Surgery*, January, 1922. As an introduction, I would like to quote from the Presidential Address of Major-General Sir Robert Jones in the British Orthopædic Association; he defines the scope of orthopædic surgery as follows:

1. Fractures—recent, mal-united, and un-united.
2. Congenital and acquired deformities of the extremities.
3. Paralysis of the extremities.
4. Diseases and disabilities of the joints, including the spine.

He suggests a scheme for hospital organization. In a general hospital of three hundred beds, he believes forty is a fair proportion to allocate to orthopædic surgery, with beds in the country for children,—the general surgeon having a right to treat any case or group of cases of extremity surgery in which he is especially interested. His aim, as is the aim of all fair-minded orthopædic surgeons, is not to take away from the general surgeon any group of cases in which he is interested, and to the treatment of which he is willing to bring devotion and skill, but to bring about a more speedy restoration of function by stimulating the interest and developing the skill of a certain group of surgeons, to whom this type of case appeals as

an interesting surgical problem and as a humanitarian necessity.

The following outline will form the skeleton of the report:

1. Congenital conditions.
2. Tuberculosis.
3. Diseases of nutrition or faulty metabolism.
4. Inflammatory conditions.
 - a. Arthritis.
 - b. Osteomyelitis, etc.
5. Statics or body mechanics.
 - a. Posture.
 - b. Foot strain and foot deformities.
6. Paralysis.
 - a. Anterior poliomyelitis.
 - b. Spastic paralysis.
7. Syphilis.
8. Scoliosis.
9. Neoplasms.
10. Tendon, bone and joint surgery.
11. Peripheral nerve injuries.
12. Dislocations.
13. Fractures.

I. CONGENITAL CONDITIONS.

Congenital Dislocations of the Hip.—This condition and its treatment again furnishes material for active controversy, as at different times in the past. There are three methods of treatment—the closed method by brutal force, with or without traction machine; the closed method by gentle manipulation; and reduction by the open method. Reduction by brutal force is growing out of fashion—partly because of the deformities which were a direct result of this method, and partly because brutal force is not required. A great many functionally good hips have, unquestionably, resulted from this method. Reduction by gentle manipulation is growing in favor; its chief promoter, Professor Denucé of Bordeaux, France, has been able to demonstrate to the satisfaction of the most critical and doubting mind, better functional and better anatomical results than any clinic in this country can demonstrate. As for open reduction, some men, such as Galloway, go as far as to advocate this method, to the exclusion of the other two. There are, undoubtedly, old cases, and some young, difficult cases where this is the only way, but open reduction is by no means anyway operation—especially not when the operator finds the acetabulum a cartilaginous prominence, instead of the promised concavity shown in the x-ray. The open method should then not be used unless the gentle, closed method has failed.

Congenital Equinovarus.—Again the knife versus force. In this case, however, the situation is somewhat different, as a combination of the two frequently is the most efficient. In young cases, application of corrective plasters

will, as a rule, be successful. In older cases, Dr. Ober's operation¹ is a helpful, logical procedure.

II. TUBERCULOSIS.

No motion, no tuberculosis. This is the keynote in the treatment of all joint tuberculosis. In children, where the element of time is of relatively slight importance, and where we have growing epiphyses to deal with, immobilization by plaster or splints, accompanied by heliotherapy. In adults, surgical intervention is the keynote of treatment, as soon as an absolute diagnosis has been made. Fusion and bone-grafting operations of the spine, arthrodesis of the sacro-iliac joint, arthrodesis of the hip, excision of the knee—all with the same aim, elimination of motion. In the majority of cases, these procedures are successful. A word of warning: For years it has been taught that tuberculosis usually is monarticular; it usually is, but secondary foci are not rare. We find secondary foci in the spine, where the primary focus has been cured by bone graft, or by fusion operations. We find secondary joints, we find secondary foci in kidneys, and last, but not least, we have tubercular meningitis. In tuberculosis of the ankle, in the most severe adult cases, amputation seems the rational procedure. It saves time and gives the patient a member he can trust, rather than a painful foot, which is apt to be the source of secondary foci. The shoulder and elbow may be treated by arthrodesis, but, not being weight-bearing joints, they respond better to immobilization than the joints in the lower extremity. The wrist is questionable; excision of the wrist, with fixation in dorsal flexion, is a very useful procedure; amputation—radical as this procedure may seem—should be seriously considered in extensive cases with sinuses. Where the time element does not play an important part, immobilization treatment by splints or plaster is the most common method of treatment.

III. DISEASES OF NUTRITION OR FAULTY METABOLISM.

Rickets.—Experimental work seems to prove that phosphorus, cod liver oil and sunlight restore the bones to normal nutrition. As regards corrective treatment of deformities resulting from rickets, some men favor osteotomy, some osteoclasia. Osteotomy is usually favored when the maximum curve occurs near a joint. Actinotherapy, by means of the quartz lamp, has been found useful in the treatment of rickets.

Osteomalacia.—Interest in this condition has been stimulated since its frequent occurrence in famine-stricken areas in Europe. This type of osteomalacia responds readily to proper food, endocrine products, and actinotherapy. The

good old-fashioned type of osteomalacia that we find in the clinics of this country is not so easily cured.

IV. INFLAMMATORY CONDITIONS.

Arthritis.—Arthritis still remains the same confusing problem, but there seems to be a steady advance toward its solution by the great amount of research work now being done in all parts of the country. Dr. Pemberton's work on carbohydrate metabolism and his general biochemical attack, are important; it is an attack from a new point of view, and has become a distinct adjunct to the routine, established method of treatment, *i.e.*, the search for, and sane elimination of the foci of infection.

Osteomyelitis.—Radical surgical intervention, so long in vogue with far from brilliant results, is gradually losing ground to conservative treatment. The principle of the conservative treatment consists in localized drainage and obliteration of cavities. The latter is brought about by the turning in of fat or muscle flaps into the osteomyelitic cavity.

V. STATICS OR BODY MECHANICS.

Posture.—Effect of posture on general health is generally accepted. Correction of posture, correction of ptosis, restoration of chest to proper functional position, have an undisputed effect on general health. Local conditions affecting digestive system, respiratory system, and functional conditions of the nervous system will be indirectly affected.

Foot Strain and Foot Deformities.—Treatment of strain consists in rest followed by exercise. Rest is brought about by supports, plates, or Thomas heels; surgical interference is rarely indicated.

Hallux Valgus.—Surgical treatment should aim at correction without destruction of weight-bearing point of first metatarsal; Kellar's operation², therefore, is growing in favor.

VI. PARALYSIS.

Anterior Poliomyelitis.—Etiology *in statu quo*. Treatment in early stages remains the same as it has for some years past,—anatomic rest during the acute stage, *i.e.*, for from one to two months, followed by muscle reëducation. In regard to surgical interference in later stages, emphasis must be laid on careful study of all muscle groups, analyzing their effect on the particular deformity to be corrected. Astragalectomy, with posterior displacement of the foot, has been used in too much of a wholesale manner; when used in cases of calcaneus, the results should be uniformly successful.

Spastic Paralysis.—Stoffel's operation, or intra-perineural neurotomy, is growing in favor. Favorable results have been obtained from op-

erations on the popliteal and obturator nerves, for the correction of equinus and adductor spasm, respectively.

VII. SYPHILIS.

Syphilis.—Attention must again be called to the frequent negative Wassermann reactions in bone syphilis, some authors finding it positive in only 50 per cent. of the cases. Anti-syphilitic treatment plus apparatus equals distinct improvement in syphilitic joint conditions.

VIII. SCOLIOSIS.

The etiology remains varied, and in a great many cases undetermined. One factor which undoubtedly will grow in importance is the factor of trauma. We have Legg's disease of the hip; in spite of the recent report of Phemister³, trauma to the epiphysis seems the most logical etiology. The spine, like the hip, has epiphyses, and not a child escapes without more or less severe falls. Why, then, should we not have Legg's disease of the spine as a common etiological factor in scoliosis?

Fusion operation on the dorsal spine is advocated by the New York School. Good results, as far as stability goes, have been obtained. The dorsal spine is selected because the articular facets in this region are in the frontal plane, and, therefore, allow considerable lateral flexibility.

IX. NEOPLASMS.

The literature on neoplasms consists chiefly in case reports, without any distinct advance in the treatment. X-ray treatment, if conscientiously carried out, has greatly improved statistics, and promises to do even better in the near future. As end-results are more carefully studied, the failures of the most radical amputations should make us pause. In this connection, there seems to be some hope in the curative effect of the high voltage currents, but this treatment is still undeveloped.

X. TENDON, BONE AND JOINT SURGERY.

Tenotomy.—One should always think twice before interfering with muscle action. A muscle will contract in proportion to the length and tone of its individual fibers; if the tone or tension of a muscle is interfered with the effective leverage of the muscle is decreased. Tenotomies or tendon lengthenings should, therefore, be seriously considered before undertaken,—a muscle with its tendon cut has only a fraction of its former power. The present attitude is distinctly in favor of tendon lengthenings by the step-like method of Bayer or the V-shaped method of Vulpius.

Derangements of the Knee-joints:

1. *Crucials.*—There is a distinct tendency to overcome disability secondary to ruptured cru-

cials by repair or reinforcement of the internal and external lateral ligaments; the results are favorable.

2. *Semilunars*.—Diagnosis not difficult if symptoms are carefully analyzed. Removal only after repeated displacements, or after initial displacement when attempt at reduction has proved unsuccessful.

3. *Transplantation of Bone*.—The fight is still on between autogenous and heterogenous bone grafts. There is, as yet, not enough evidence in favor of either to make a definite decision. In regard to medullary graft *versus* bone inlay, the evidence is distinctly in favor of the latter.

4. *Ankylosing Operations on the Spine*.—Polya suggests a modification of Albee's method, by which the graft is inserted at the base of the spinous processes; Forbes has a modification of Hibbs' operation. The principle of all ankylosing operations is, of course, the same; no one method will be uniformly successful. Any surgeon should be conversant with the different procedures, so as to be able to choose the one best adapted to the case in hand; sometimes a combination of two methods is advisable.

5. *Ankylosis of Sacro-iliac Joint*.—This operation is indicated in adult cases of tuberculosis of the sacro-iliac joint, and in selected cases of sacro-iliac relaxation. It has been performed with considerable success by different methods. Hertz uses a bone-peg; Smith-Petersen a dowel.

6. *Arthroplasty*.—The work of Putti is known to all; as the technique becomes perfected, arthroplasty will undoubtedly be used in many cases where arthrodesis is now the common procedure. It will never replace arthrodesis, however, especially not in the tuberculous joints. We should never undertake arthroplasty, except in well-selected cases.

XI. PERIPHERAL NERVE INJURIES.

The fantastic methods of nerve repair have all been abandoned—end-to-end suture without tension remaining as the only logical and physiological method. By end-to-end suture, good results are obtained in motor or sensory nerves; in cases of mixed nerves, results are less favorable; neurolysis is successful in the majority of cases. Where nerve suture fails, tendon transplantations will, in many cases, greatly improve function; the most striking example of this is found in the transplantations after the manner of Jones and Starr, in cases in which irreparable damage and failure of repair of the radial nerve have occurred.

XII. DISLOCATIONS.

Recurrent Dislocations of the Shoulder.—Sever depends on tenotomy of the pectoralis

major and shortening of the sub-scapularis tendon to decrease leverage and strengthen weakened inferior portions of the capsule. Thomas feels that reefing of the capsule is sufficient. Both procedures are successful in the hands of the authors, in the majority of cases.

XIII. FRACTURES.

Dr. Osgood, in his article on "The Standardization of Methods of Treatment in Orthopædic Surgery and in Industrial Surgery of the Extremities and Spinal Column,"⁴ concisely summarizes the present attitude in the treatment of fractures: "In the early treatment of fractures of the long bones, the essential factor in relieving pain, securing alignment, maintaining fixation, and in general minimizing shock, is traction,—traction immediately applied and maintained without remission until union has begun and muscle spasm has ended. Of course, we must have radiographs in two planes, or better, stereoscopic. We must have fixative splints, alone or in conjunction with Balkan frames, weights and pulleys, but we must have traction before all these,—traction of the earliest possible moment. If there is danger that joints will become ankylosed, let us be sure that the position of ankylosis is that of greatest function—a shoulder in 70-80° of abduction; the upper arm half-way between the mesial and horizontal planes in slight outward rotation; the elbow, depending on the occupation, one side or the other of the right-angle position, but never in extension; the wrist in half-normal, dorsal flexion; the hip in slight flexion and slight abduction and slight outward rotation; the knee in 10° of flexion in a man who must walk well and stand at his work, but in 20-30° of flexion in most women, who sit at their tasks; the foot at a right angle to the lower leg, and never abducted."

For complete abstracts of articles dealing with orthopædic surgery, I refer the reader to the "Sixteenth Report of Progress in Orthopædic Surgery."⁵

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- ⁵ *Archives of Surgery*, Jan., 1922, vol. iv, pp. 200-235.

DR. MAURICE BLOOM of England, who has recently visited the United States, contends that within one hundred years every person in this country will be wearing glasses. He suggests that we are traveling at a pace that kills, and calls attention to the amount of work which is done under artificial illumination. We work too much, our systems are overtaxed, and we are abusing our eyes by reason of improper arrangements for proper lighting facilities.