segment. Munro Kerr's section however, can easily be done irrespective of whether the patient has been in labour or not. A full and beautifully illustrated description of De Lee's Cæsarean section is to be found in his text-book of obstetrics. The abdomen is opened as in Munro Kerr's section and a retractor is inserted as above. Briefly the chief points are that, after the peritoneum is incised transversely and an upper and lower flap raised up, the bladder is then separated from the lower uterine segment by finger and gauze pressure. The bladder is then retracted downwards and the lower uterine segment is opened by a longitudinal incision. The hand inserted into the uterus rotates the head to bring the face into the wound. The face is then helped out of the wound by forceps or manipulation and the rest of the baby follows. The placenta is delivered into the wound and the membranes are wiped off by gauze pressure. If bleeding from the uterus is free, it is plugged with gauze which is led into the vagina. The uterine wound is sewn up in three layers with interrupted catgut sutures. The bladder is replaced over the wound and the peritoneal flaps are overlapped and sewn up. The abdomen is then closed.

In the lower segment type of operation, nothing should come into the field of the operation except the lower part of the uterus. There is, therefore, very little soiling of the peritoneum. A great advance has, therefore, taken place by providing for late cases, a method which is very much safer than the classical method. Stein and Leventhal(7) have published a record of 32 cases which had test labours and which were afterwards delivered by the lower uterine segment incision. The mortality was nil: the shortest time in labour was twelve hours and the longest 66 hours, the average being 29.8 hours. Danfort and Greer(8) similarly have reported 30 cases safely delivered by this method after having test labours averaging 21.7 hours. Most authorities agree that this new method should displace the classical operation in cases of doubtful infection, and some authorities are so enthusiastic that they urge the complete abandonment of the classical operation in favour of the lower uterine segment section in all cases. It is not yet possible to compare the results of the one with the other. The former is often performed in unsuitable surroundings (and perhaps on unsuitable occasions) by many men who make no claim to being specialists: the latter has been performed so far, only by specialists who have suitable operating theatres, etc., at their disposal: nor has the lower segment operation been in wide use long enough to collect complete figures of rupture of the scar. De Lee(9) states that "not more than 12 cases of uterine rupture after the low Cæsarean have been reported up to date" (i.e., end of 1926) and believes that the performance of low section more generally, would reduce the incidence of uterine rupture to less than one-tenth of what it is.

Two objections to the lower uterine segment operation that I have found are:—(*a*) one cannot sterilize the patient and (*b*) preserving the uterus in a septic case may mean the death of the patient from puerperal sepsis after some time. It is my belief, therefore, that if the patient is frankly septic, (i.e., with a raised temperature and an offensive discharge) or in a doubtful case if she has had several children, or if she is suffering from osteomalacia, the wisest plan is to do a Cæsarean hysterectomy, which is what may be called Type 3. I have never regretted doing it. The technique is briefly as follows:—

III. CÆSAREAN HYSTERECTOMY.

Carefully sterilize the vagina. After opening the abdomen, very carefully pack off the area of the uterus which it is proposed to incise. Open the uterus as for the classical section and deliver the baby. (If the baby is known to be dead, it should be left in the uterus which should be delivered unopened outside the abdominal cavity.) Carefully pack towels behind and around the uterus which is now delivered outside the abdomen. Leave the placenta in the uterus or push it into the vagina. Subtotal hysterectomy should now be performed or total hysterectomy if the os is widely dilated. The peritoneal cavity can be drained if it is considered necessary either through the lower angle of the wound or through the vagina.

I am convinced, furthermore, that this operation should entirely displace those dreadful operations of embryotomy where, in a series of very long and difficult manipulations, the fœtus is removed piecemeal through a contracted pelvis. The mortality of embryotomy is enormous and would be vastly diminished by substituting for it Cæsarean hysterectomy.

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SEVEN CASES OF DIAPHYSIAL ACLASIS (MULTIPLE EXOSTOSIS) IN INDIANS, INCLUDING FOUR CASES FROM ONE FAMILY.

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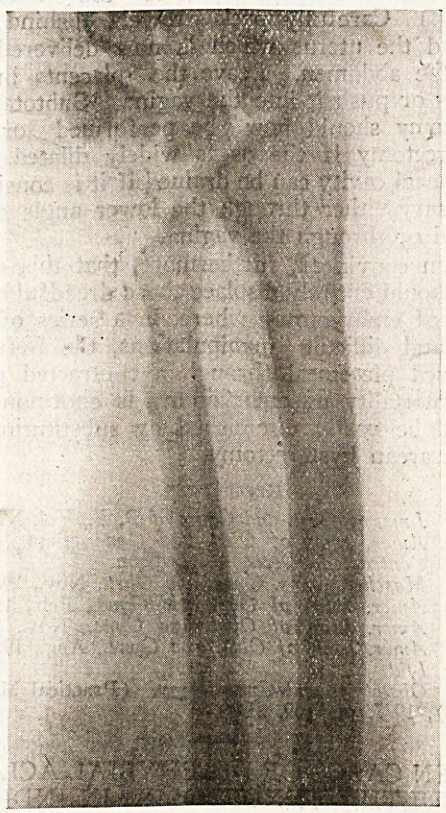
MULTIPLE exostosis (the diaphysial aclasis of Sir Arthur Keith) does not seem especially rare in Indians, but it appears that in all the London museums of pathology there is only one skeleton which illustrates this condition. Our attention

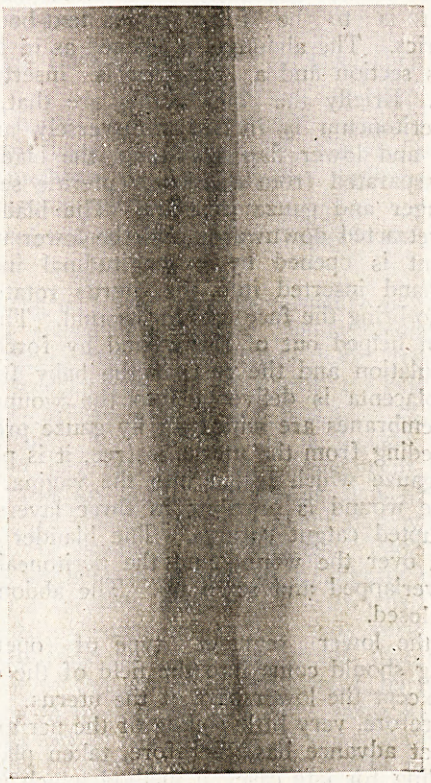
was first closely drawn to the disease by the admission into King George's Hospital of the patient whose history follows as Case 7. This patient died in hospital and we were fortunate in being able to obtain his skeleton for our museum. Plate I, fig. 1 shows the patient in life, Plate I, fig. 2 shows an X-ray photograph of his skeleton taken during life, and Plate I, fig. 3 his actual bones. A summary of what is known of the pathology of his condition follows the case description. Cases 1, 2, 3 and 4 are from a remarkable family of whom 9 were reported to be affected amongst 27 members. Case 5 was an old woman and case 6 a female child both without known family history.

Case No. 7.—The patient was a Hindu male of about 28 years, a Sadhu by caste and a non-vegetarian. He was admitted on 9th December, 1926, into King George's Hospital, Lucknow, for joint pains producing difficulty of movement during the past 2 months, also for breathlessness, cough and slight fever for 6 months. He died in hospital on 12th January, 1927.



Skiagram 2.

History.—His history was unreliable. He stated that the joints of the lower limbs and the right wrist had become swollen and painful after a dysentery attack two months previously. Before that he could walk and run like other men. He said he had had a penile sore and a penile discharge six months ago, that his father had had syphilis and that both parents died of cholera. He stated that he had not noticed the bony enlargements round his joints. None of his near relations had bony projections round these joints. He lived in Bilaspur until he was 12 years of age, in Ajudhia until he was 14, and in Hardwar until he was 21. None of these are endemic goitrous areas. He had never had a goitre.



Skiagram 2.
(Latest view.)

Condition on Admission.—Patient was thin and weak, weight 83 lbs. Height 5 ft. 3 inches. Chest (nipple level) 30 inches. Abdomen (umbilicus) 26 inches.

Locomotor System.—On examination the curious bony projections round both knee joints and ankle joints attracted immediate attention (*see* photo. 1). These projections gave the region of the knee joints an elongated appearance, and an apparent shortening and lateral curvature to both tibiæ. On closer examination, irregular projections from the upper and lower extremities of the tibia, fibula and femur on both sides could be made out, but the main enlargements were round the knee joints, that is, at the region of maximum growth of the leg bones. One projection, on each side, in the region of the adductor tubercle was especially marked. In the upper arm the expansion of the bony extremities was less but was again at the ends where growth was greatest, i.e., at the shoulder and wrist joints. The carpal, tarsal, metacarpal, metatarsal and phalangeal bones

PLATE I.

Fig. 1.

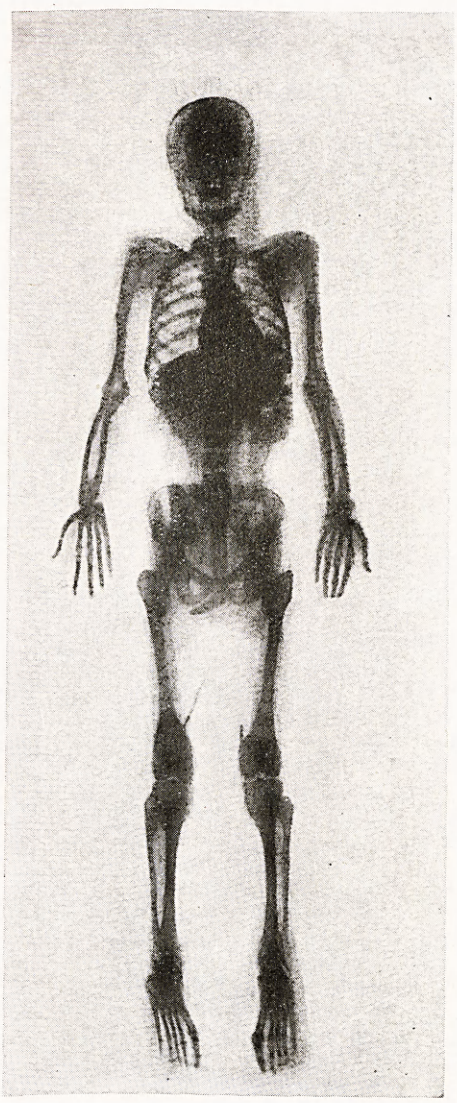


Fig. 2.

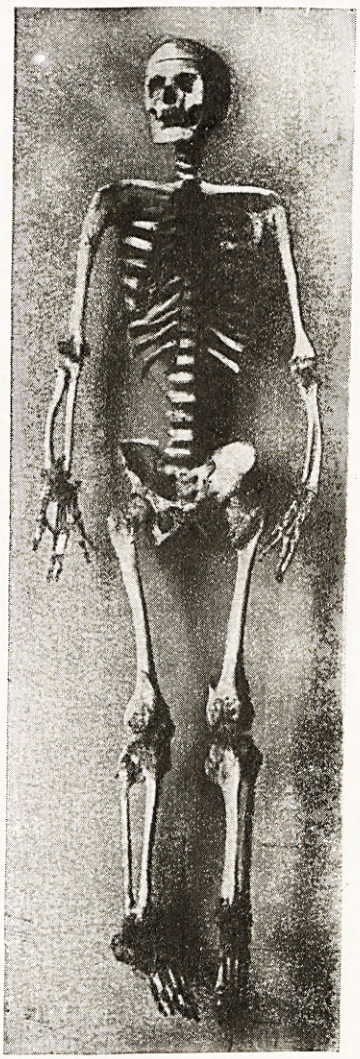


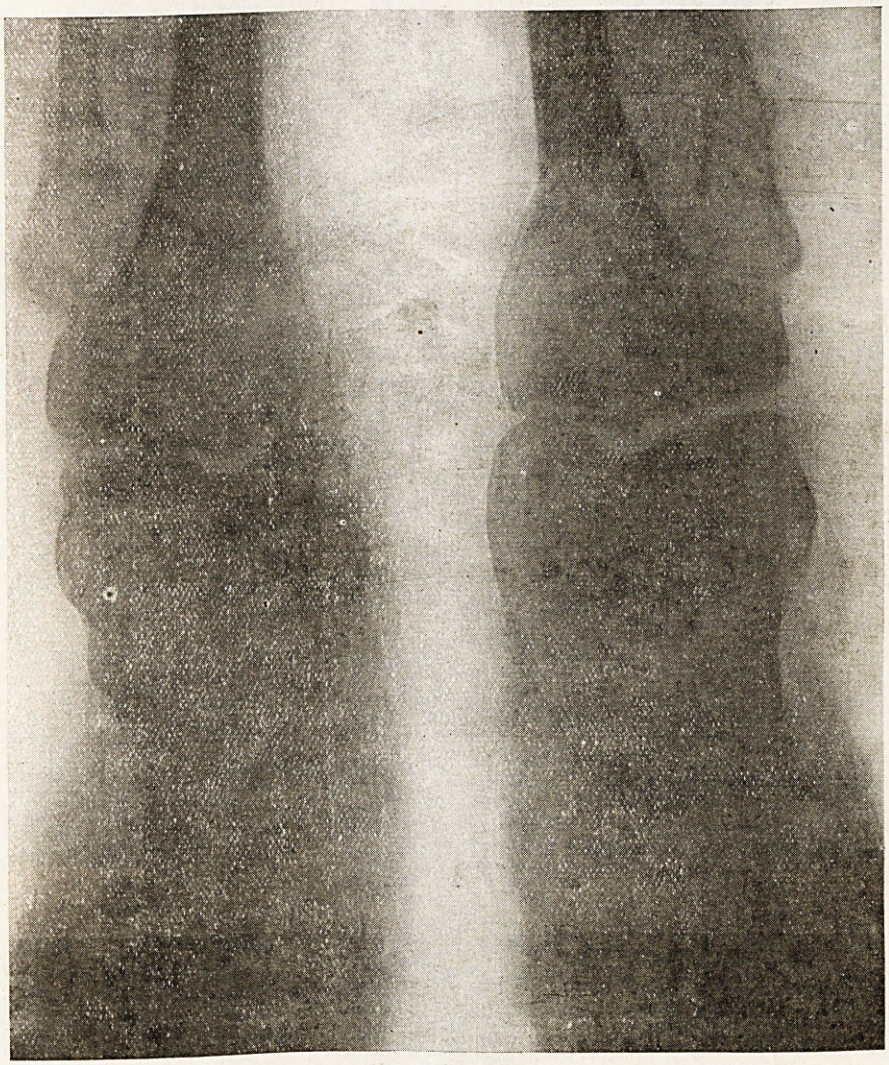
Fig. 3.

were in the main unaffected, but one or two bony nodules could be felt at the base of the metacarpals and metatarsals.

The pelvis seemed unaffected except for an obvious nodular lipping along the outer margin of each iliac crest. In the shoulder girdle a similar nodular lipping existed along the vertebral border of the scapula and to a less degree along the scapular spine. The coracoid process was enlarged on both sides. The bony wall of the chest showed two marked changes. The left tenth rib was markedly expanded throughout its whole length, and there were nodules where the costal cartilages joined the bony ribs giving the appearance and feel of a rickety rosary. The hand and face bones were unaffected, so also was the spine except that the posterior process of the 7th cervical and 1st dorsal vertebræ seemed unduly prominent.

None of these bony growths, of themselves, limited the joint movements but there was some slight swelling of the right ankle and to a more marked degree of the right wrist—which was considered to be of a totally independent nature either post dysenteric or possibly tuberculous. No urethral pus could be expressed and no gonococci were detected in the prostatic secretion. An average of several total blood counts worked out at 8,080 white cells per c.mm. with a differential count of 65 per cent. polymorphonuclears, 32 per cent. lymphocytes, 2 per cent. large mononuclear, and 1 per cent. eosinophile cells.

Respiratory System.—Both lungs showed signs of diffuse broncho-pneumonia, and tubercle bacilli were present in the sputum. There were no dull areas. The temperature showed an evening rise to 99° or 100°. On only one occasion did it rise beyond, to 102°.



Skiagram 1.

Alimentary System.—Normal, except that the spleen was enlarged to four fingers below the costal margin, and was very hard in consistence. The enlargement was probably malarial though no parasites were found in the peripheral circulation.

Circulatory, Nervous and Endocrine Systems.—Showed no marked abnormality. He complained of night-blindness for past two months but no eye lesion could be detected by Dr. Acharya, Professor of Ophthalmology. The conjunctivæ of both eyes were reflected on to the eyeball from the lower lids and showed a very definite black pigmentary deposit, which was also present on the left upper and left lower gum margins as far as the middle line. There was no explanation of this pigmentation. No silver preparation had been used locally to the eye or internally. The thyroid showed no alteration in size. There were no signs of hyper or hypothyroidism.

Genito-Urinary System.—The urine was normal. The blood serum was positive to the Wassermann reaction, completely deviating 3 and 5 (but not 8) minimum hæmolytic doses of complement.

Progress.—The treatment adopted was for tuberculosis and syphilis, but the patient rapidly went downhill and died after some 5 weeks in hospital.

Skiagram 3.

Post-mortem.—Within two hours of death.

Alimentary System.—Nothing abnormal, except that the mesenteric glands were slightly enlarged and bright red. Liver weighed 53 ozs.

Excretory System.—Kidneys normal, each weighed 3.5 ozs.

Circulatory System.—Heart (6 ozs), valves and aorta normal.

Nervous System.—Normal. Brain weight 42 ozs.

Respiratory System.—Right pleura adherent over the upper lobe, left pleura adherent over the diaphragm. Right lung (12 ozs.) studded with tubercles. Left lung (14 ozs.) lower lobe studded with tubercles. Root glands—enlarged and caseous.

Hæmopoietic System.—Spleen 20.5 ozs. greatly enlarged and fibrotic. Capsule thickened.

Endocrine Glands.—Pancreas 3 ozs. Thyroid 25 grams. Thymus—could not be traced. Suprarenals—right 3.55 grams, left 2.55 grams.

Skiagram 4.

Pituitary—0.5 grams. Pineal—0.2 grams. Testicle—right 34 grams, left 21 grams.

Diagnosis and Notes.—The bony condition is typical of that formerly described as multiple exostosis or under the more modern name of "diaphysial aclasis." The condition is definitely removed from the category of bony tumours and is due to a growth disorder of cartilage, whereby the cancellous bone laid down between the diaphysis and epiphysis is imperfectly modelled by its lateral periosteal covering.

The shafts of long bones grow by two distinct processes.

(1) New cancellous bone is first laid down at the shaft extremities in the diaphysial line. Achondroplasia results when this process is defective.

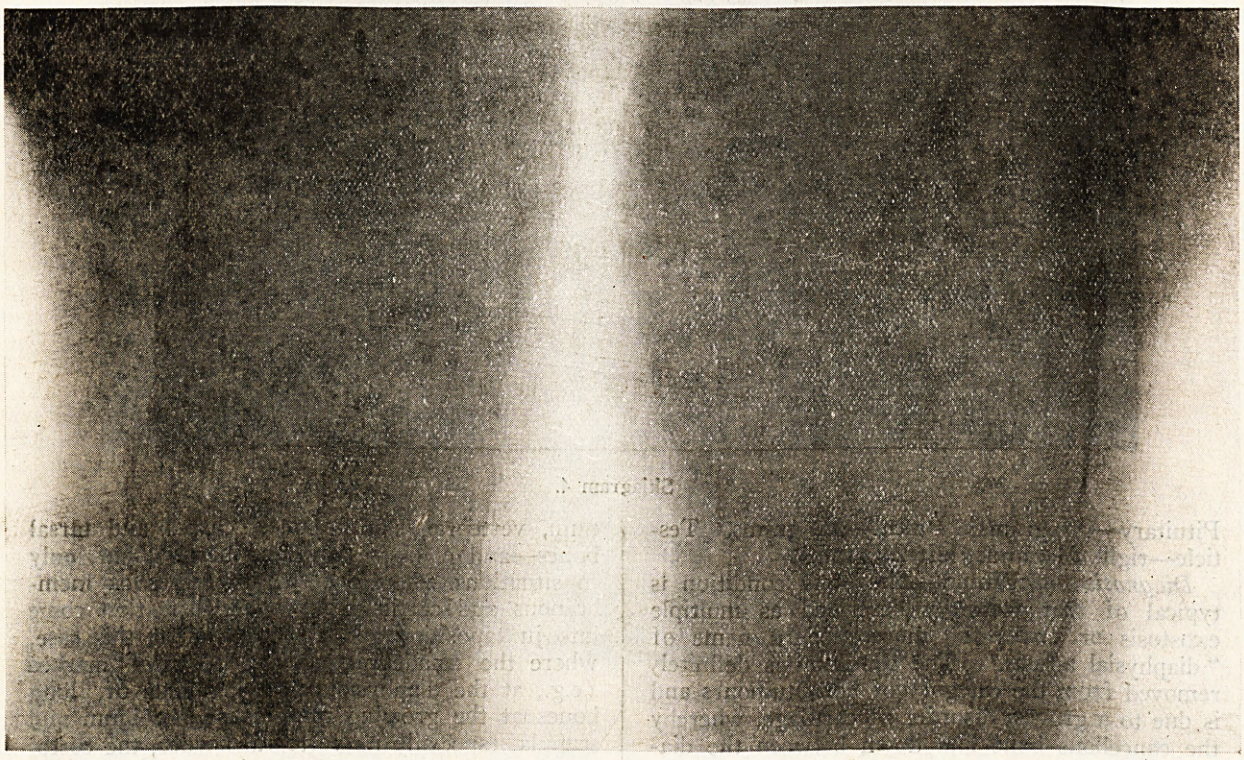
(2) In the second or modelling process, this cancellous bone is absorbed and gradually converted into the compact shaft bone with its medullary cavity. In diaphysial aclasis all long bones exhibit one and the same defect, namely, arrest of the modelling process. Hence, in the several outgrowths of cancellous bone which arise, growth is vigorous and prolonged as this case well illustrates.

This disease does not arise in membranous bones (e.g., in the face bones or skull vault), nor in bones formed in cartilage (e.g., the sternum, vertebræ, skull bones, carpal and tarsal bones—and epiphyses of long bones), but, only in situations where the two processes of membranous and cartilaginous bone formation come into juxtaposition and especially, as in this case, where the modelling growth is most marked (e.g., at the diaphysial growing ends of long bones at the growing margins of the ilium and scapula, especially its vertebral border, the costochondral junctions and at both ends of the clavicle).

In the present case, X-rays show some abnormal periosteal deposit along the shaft of certain long bones. Bland Sutton states that the bones are often abnormally thick. The disease usually starts in childhood and ceases with skeletal growth—and the probability is that this is what occurred in this patient. The diaphysial ends of

the tibia and fibula are often fused as in this case. Also growth of the distal end of the ulna is deficient, whilst that at the distal end of the radius continues—whence the radius becomes "bent to form a bow," the ulna serving as a

Skiagram 5.



Skiagram 6.

"stretched string." The proximal end of the radius is sometimes dislocated and the external epicondyle of the humerus detached.

Case No. 1.—Syed Jawad, a Madrasi male, aged 18 years, complained of bony growths around his knee, wrist, and shoulder, present since birth. These growths cause him no trouble. They have never been painful nor tender. He cycles comfortably and well. The tumours gradually enlarged in proportion to his body growth and have not been growing lately. No venereal history. Lymph glands, thyroid and spleen normal. All systems normal. Height 5 ft. 8 inches, chest at nipple level 30½ inches, weight 120 lbs.

Position of Bony Outgrowths.

(1) Around both knee joints especially at the lower ends of both femora with marked pro-

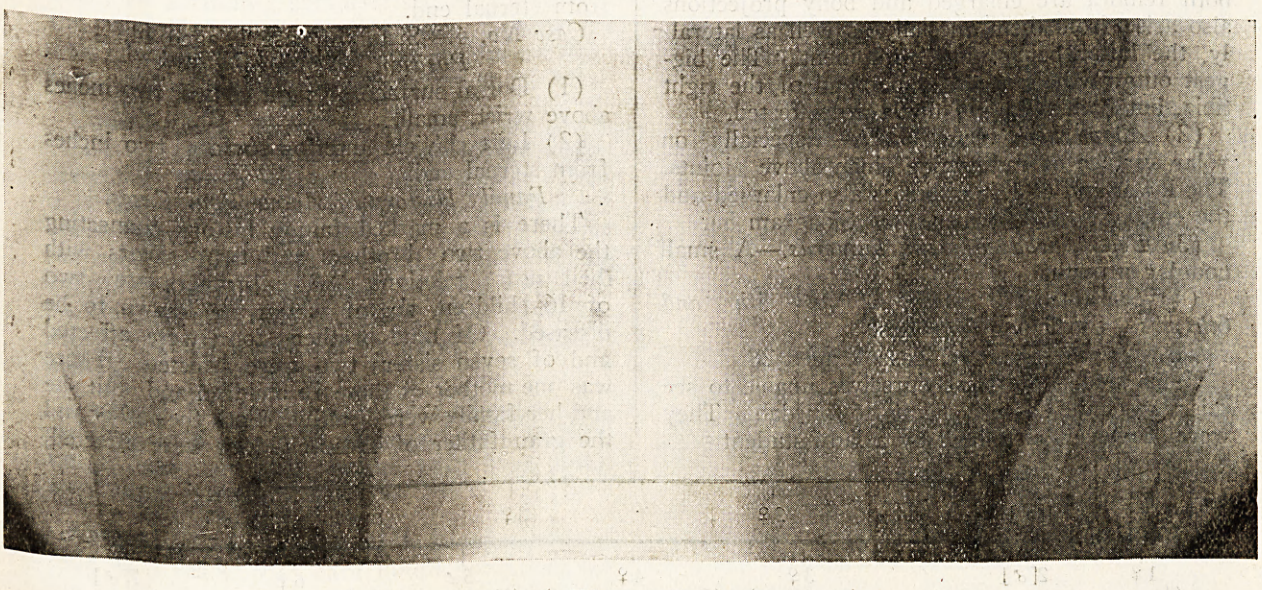
jections 2½ inches above the joint. Also expansion of upper end of both tibiæ and fibulæ (*see* Skiagram 1).

(2) At lower end of radius on the right side about 2 inches above the wrist (Skiagram 2 shows both lateral and antero-posterior views).

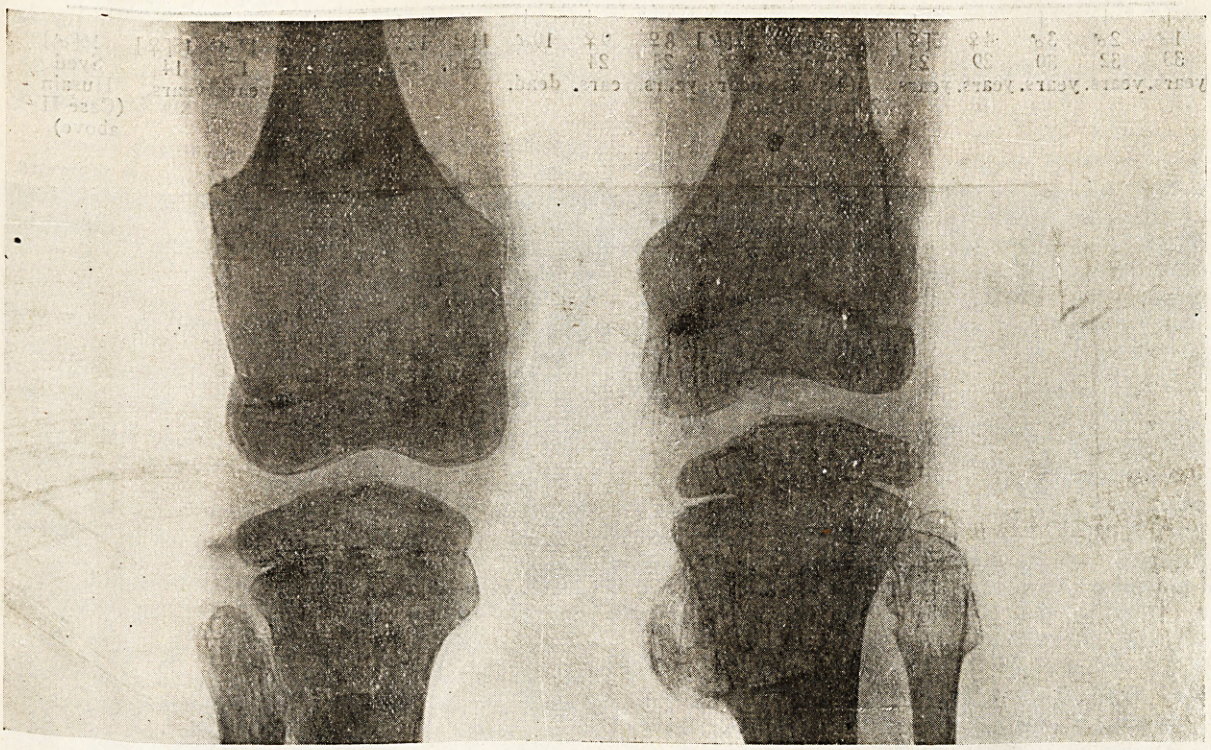
(3) At the proximal end of left humerus, just below its head (Skiagram 3).

(4) The lower half of the left border of the scapula shows marked thickening.

(5) The costo-chondral junction of the left sixth rib shows marked thickening, also less thickening at the right third costo-chondral junction.



Skiagram 7.



Skiagram 8.

The iliac crests, spine, skull and face bones, also the tarsal, metatarsal, carpal and metacarpal and phalangeal bones and phalanges appear free. So also are the ankle, hip and elbow joints.

Case No. 2.—Syed Husaid, brother of case 1. A school boy, aged 12. Duration of enlargements, since birth. No inconvenience.

Sites of Noted Enlargements.

(1) *Around both knee joints.*—Lower ends of both femora are enlarged and bony projections also arise from them, mesially as well as laterally, the latter being more prominent. The biggest outgrowth is at the upper end of the right tibia, but both tibia and fibula are affected.

(2) *Above both wrist joints.*—Especially on volar surface of radius one inch above joints. The lower end of left radius is also enlarged and the epiphysis is deformed (*see* Skiagram 5).

(3) *Below head of left humerus.*—A small nodular growth.

(4) *Sterno-costal junctions of 5th and 6th ribs.*—Small bony nodules.

Case No. 3.—Sister of Case 1, aged 28. Unmarried. We were ourselves unable to see this case and Case 4 owing to purdah. They were, however, examined by a lady student.

Position of Outgrowths.

(1) Dorsal surface of left radius, three inches above wrist.

(2) Seventh right rib, external surface, almond size, three inches from sternum.

(3) Right clavicle anterior surface, two inches from sternal end.

Case No. 4.—Sister of case 1, aged 14.

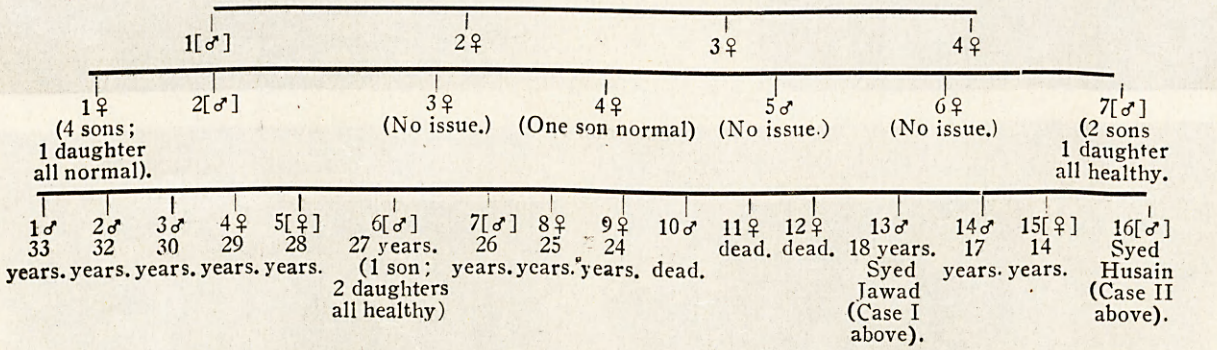
Position of Outgrowths.

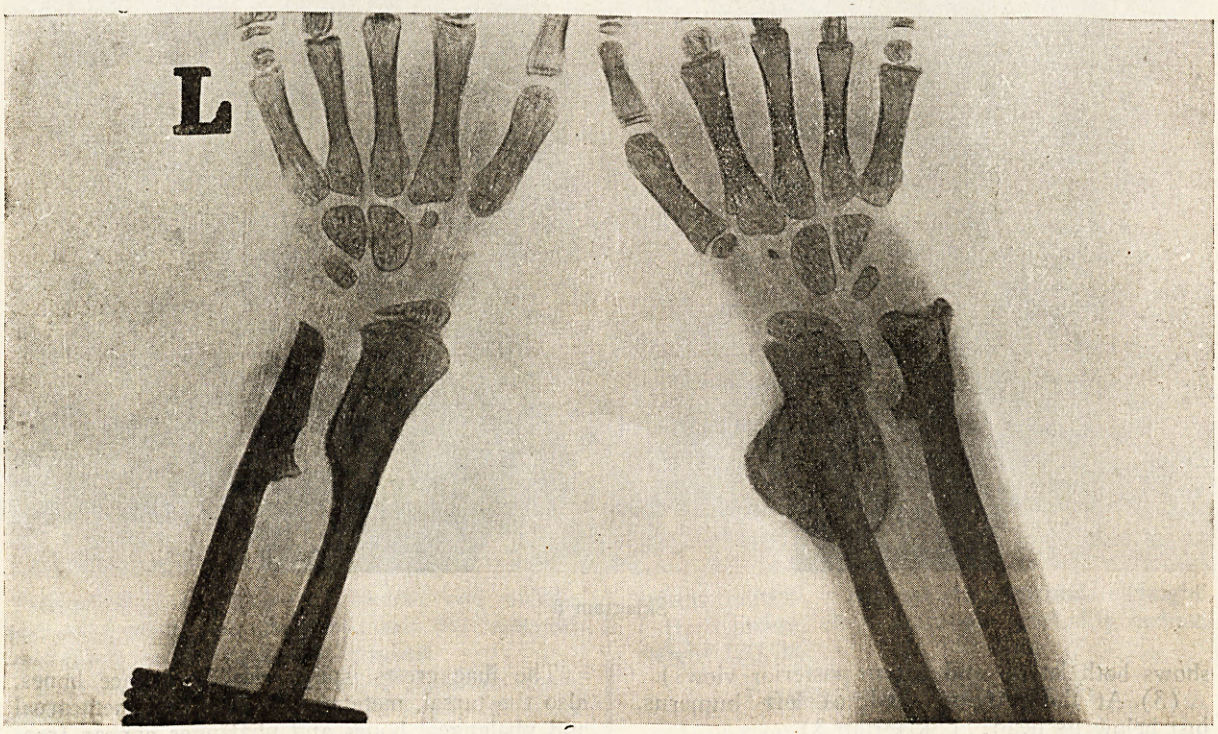
(1) Dorsal surface of right radius, two inches above wrist, small.

(2) Left clavicle anterior surface, two inches from sternal end.

Family History of Above Four Cases.

There is a marked family history connecting the above two brothers and two sisters with their near relations. The brothers are two of 16 children, six of whom are known to be diseased. Of nine brothers four were affected and of seven sisters two were affected. There was one mother of these 16 children and both she and her family were healthy. Both the father and the grandfather of these children were affected.





Skiagram 9.

In the father's family there were seven children, three males of whom two were affected, and four females none of whom were affected. There is no history of any other relations suffering from this trouble. The family state that a distant ancestor on his death-bed said that bony outgrowths would be a future characteristic of his family, and that this would be transmitted through his sons. The family tree is given on the previous page; diseased members are shown in squares.

Children Nos. 13 (Case 1), 16 (Case 2), 5 (Case 3) and 15 (Case 4) have already been described. There remain children 6 and 7. Child 6 is said to have bony outgrowths round both knees bigger even than those of case 1, but he can cycle without trouble. Child 7 has also big outgrowths round the knees. Possibly some of the children described as healthy have small outgrowths which would not be missed on medical and X-ray examination.

Case No. 5.—An old woman of 55 years, who came to hospital for gynæcological trouble. Large bony growths round both knee joints were noted (Skiagrams 6 and 7).

Case No. 6.—Sadika, a Mohammedan female child of 8 years, with hard lumps noticed at the age of one year on the left wrist and at the age of 7 round both knees. The wrist swelling was attributed to a fracture. All swellings have slowly increased in size but cause no discomfort. The patient is anæmic and thin but not emaciated. Height 2 ft. 11 inches. Weight 37 lbs. No evidence of congenital syphilis.

Family history.—Showed no similar condition amongst its members. Father and mother alive and healthy. Two brothers and one step brother, all healthy.

Position of Bony Lumps (Locomotor System).

1. *Shoulder joints*—upper ends of humerus on both sides are considerably thickened.

2. *Left scapula*—small nodule on vertebral border, just below spine.

3. *Both clavicles*—showed small nodules at acromial ends.

4. *Elbow joints*—small nodules on right olecranon process.

5. *Wrist joint*—big projection left radius—small ones of the right radius and both tibiæ. (*See* Skiagram 9).

6. *Hip joint*—right great trochanter slightly thickened.

7. *Hip bone*—small nodules on both iliac crests.

8. *Knee joints*—bony thickening on all sides of both joints (Skiagram 8).

9. *Ankle joints*—some nodules both sides.

10. *Hands and feet*—normal.

11. *Ribs*—small nodules about one inch from costo-chondral junction on 5, 6, 7, 8, and 10th left ribs and on 4, 5, and 6th right ribs.

12. *Sternum, vertebræ, skull and face bones*—unaffected.

No abnormality was found in the respiratory, circulatory, alimentary, nervous, endocrine or urogenital systems.

A NEW TEST FOR ALBUMIN IN URINE.

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THERE is considerable difference of opinion among experts as to which of the many tests employed for the detection of albumin in urine should be regarded as the most reliable one. It is hoped that the addition of the following new test to the list will be appreciated by the medical profession on the ground of its simplicity, delicacy and reliability. When it is remembered that none of the recognised tests is without its fallacies and that certain special advantages are obtainable from the employment of the new test, the writer thinks that a case has been made out for its publication.

The *reagent* used for the new test is *a saturated solution of saccharin in water* prepared by boiling saccharin in distilled water until no more saccharin is dissolved. Allowing the solution to cool, the next step is to filter it and preserve the clear solution in a stoppered phial. On standing for some time, a few crystals of saccharin may separate out and settle at the bottom; these may be allowed to remain.

The test may be performed in the same way as one does the Heller's test with nitric acid. It is best to take a long and narrow test tube, about one-sixth full of clear urine and held in a slanting position. Now slowly and carefully allow the reagent to run along the side of the test tube by means of a pipette; it will settle at the bottom. If albumin is present in the urine even in traces, a sharply defined white ring will slowly form at the junction of the two layers of fluids, best seen when held against a dark background, the ring does not disappear on the application of heat. Strong nitric and picric acids behave in a similar way with albumin in the urine and with regard to delicacy, all the three tests are probably of equal merit, but there are certain advantages which the saturated solution of saccharin possesses over the other