Genetically there was nothing in the family history to suggest a sex-linked transmission of the diabetes insipidus. In these patients the inheritance was probably mediated by an autosomal recessive gene.

No evidence of a space-occupying lesion was found in either child. It was not possible to explain the presence of both diseases on the basis of a single anatomical lesion. It was concluded, therefore, that the two diseases coexisted through the chance coincidence of two unrelated genes.

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MULTIPLE EPIPHYSIAL DYSPLASIA

BY

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The term of "epiphysial dysplasia" was suggested by Fairbank (1935) for a group of cases characterized by irregularity in density and outline of several of the developing epiphyses, dwarfism, and stubby digits. Since his account of this condition many further cases have been reported. Nevertheless, multiple epiphysial dysplasia is uncommon enough to make the following cases of interest.

This report of six cases in one family, with strong presumptive evidence of other affected members, follows the pattern of simple dominant inheritance. However, there was considerable variation in the severity and locality of the affection.

Genealogy.—The family tree is shown here. Male members I2, II4, and III7 are known to have suffered

Her brother (V 5) aged 11 was found to have epiphysial dysplasia, affecting ankles, hips, and upper humeral epiphyses. The knee-joints were normal.

The father of these children (IV 4), aged 49, was thought to have had rickets at the age of 2, and at 14 he had corrective osteotomy for genu valgum. He has led an active and

Details of Cases Examined

	III 1	IV 2	IV 4	V 3	V 5	V 6
Age	75	45	41	25	11	9
Shoulders	Normal	Normal	Normal	Normal	MED	Normal
Hips	MED	MED	MED	MED	"	MED
Knees	"	"	"	"	Normal	"
Ankles	Normal	"	"	"	MED	"
Spine	"	"	"	"	"	"
Symptoms	None	Osteo-arthritis of right hip	Painful knock-knees as a child relieved by osteotomy	Childhood only	Flat-feet	Painful knock-knees relieved by osteotomy

MED = Multiple epiphysial dysplasia.

symptom-free life in the Navy since. Radiographs of his knees and ankles showed marked epiphysial dysplasia.

His father (III 2) was also thought to have suffered from rickets at the age of 2. He too was a naval officer, and had no trouble in later life.

The case of V 3 was reported by Fairbank (1947), and a radiograph is illustrated in Fig. 297 of that paper. Although he suffered from symptoms in early life, he is now 25 and has been symptom-free for 10 years.

Summary

Six further cases of multiple epiphysial dysplasia in one family are reported, with probable affection in six other cases not available for examination.

The disability of those affected, even in the presence of marked radiological changes, may be negligible; and the regularity of dominant gene inheritance may be demonstrable only by radiology.

Unlike the family described by Weinberg *et al.* (1960), there was a haphazard distribution of the affected joints. The shoulders were affected in only one case (V 5), and in this patient the knee-joints escaped.

REFERENCES

- Fairbank, H. A. T. (1935). *Proc. roy. Soc. Med.*, **28**, 1611.
 — (1947). *Brit. J. Surg.*, **34**, 225.
 Weinberg, H., Frankel, M., and Makin, M. (1960). *J. Bone Jt Surg.*, **42B**, 313.

The family tree.

from a hereditary bone condition (almost certainly epiphysial dysplasia) which had affected previous generations of the family. In generation III four members out of seven were affected. Only one of these (III 1) was examined, however. In generation IV there were two affected members, and in generation V three were traced.

Case Histories

V 6, a girl aged 9, was referred with painful knock-knees. She presented the typical "dumpy" bodily habitus of epiphysial dysplasia, with affection of the knees, hips, ankles, and vertebral column. After a year's observation corrective osteotomy was performed with complete relief of symptoms.