

News, Notes and Queries

The value of legislation and the speed with which it may be introduced depends to a large extent upon public opinion. In a special supplement on the Factory Act of 1937 an earlier statement of the *Times* on public health legislation is quoted 'Mr. Chadwick and Dr. Southwood Smith have been deposed. The people of England prefer to take their chance with cholera and the rest rather than be bullied into health'. Parliament continued to pass legislation to prevent epidemic disease and factory accidents but as the *Times* says 'legislation has never been allowed to advance too far in front of public opinion.'

REFERENCES

- Annual Report of the Chief Inspector of Factories and Workshops for the Year 1932*, H.M. Stationery Office, 1933.
LEE, W. R., 'Robert Baker: The first doctor in the Factory Department', *Brit. J. Indus. Med.*, 1964, 21, 85 and 167.

ELMSLIE AND FIBROCYSTIC DISEASE OF BONE

by

P. J. STILES

IN the early years of this century, orthopaedics began to emerge as a special branch of surgery. Its practice had until that time been largely empirical and its problems were considered to be anatomical and mechanical. Little clinical thought had been given to the basic sciences of physiology and pathology and their application to orthopaedics. One of the few exceptions to this was the work of Sir James Paget and Bowlby in their original observations on osteitis deformans. They combined clinical and pathological observations on this condition so that an easily recognized disease emerged.

Reginald Cheyne Elmslie was born in 1878, two years after Paget read his paper to the Medico-Chirurgical Society, but when he arrived as a student at Paget's hospital in 1895, no further significant advances had been made in the basic pathology of bone disease. The detailed and exhaustive pathological observations of the German pathologists had created a maze of confusion because they were not correlated with clinical findings. It remained for Elmslie to explore this field, and apply his genius to relating his own clinical experience with his profound knowledge of pathology.

Soon after qualifying in 1901 he took an appointment in the Pathology Department at St. Bartholomew's Hospital where he remained for five years. During this time he developed his pathological approach to clinical problems. The fruits of this work are seen in his Essay, *The Pathology and Treatment of Deformities of the Long Bones Due to Disease Occurring During and After Adolescence*, for which he was awarded the Jacksonian Prize in 1905. In this he reviewed a remarkably wide field of bone pathology including his own original observations on the aetiology of coxa vara which remain one of his most enduring contributions to orthopaedics. There was no direct mention of fibrous osteitis (fibrous dysplasia). He did however comment that Von Recklinghausen described cysts in osteitis deformans but Elmslie had some doubt

as to whether this was true Paget's disease, as he thought there was no clear evidence of the occurrence of cysts in this disease. In this observation lay the seeds of the problem that was to occupy much of his thought, and which flowered to produce a number of papers on fibrous osteitis and cystic diseases of bone.

His views on the place of pathology in the study of orthopaedics are best illustrated by his own words from his Presidential Address to The British Orthopaedic Association in 1930—

Mechanics, anatomy, and physiology take leading places in the training of an orthopaedic surgeon, and the study of pathology is apt to be neglected. Opportunities for pathological work are however, very frequent in orthopaedic surgery, and until recently these opportunities have not been utilized to the full. We have only to survey the conditions that we are treating daily, to find numerous examples of conditions of which the pathology is still unknown or uncertain. There are, indeed, few fields in which there is such a large volume of work waiting to be done. This is true of the pathology of muscles, tendons and joints, but it is particularly true of the pathology of bone.

He goes on to suggest that the delay in acquiring an accurate knowledge of the pathology of bone is probably due to the difficulties of technique and the problems of interpreting the findings. He makes the very important observation that the reactions of bone are limited and therefore different diseases may produce similar pathological pictures. The failure to appreciate this had resulted in a confusion amongst pathologists on the classification of bone disease. It was this that had led Von Recklinghausen to consider his original case of fibrocystic disease which he described in 1891 to be a variety of Paget's disease. In both conditions there is osteoblastic and osteoclastic activity in association with fibrosis of the marrow which makes them pathologically similar. But clinically they are very different conditions; Elmslie with his clinical and pathological knowledge was in a peculiar position to appreciate this, and his classification of fibrocystic diseases of bone is based on it.

In 1912 he published a short paper in the *St. Bartholomew's Hospital Reports* in which he discussed the diagnostic problems of endosteal tumours. He drew attention to the common error of surgeons at that time to assume that these were malignant, and consequently to proceed to radical surgery. He made it clear that most of these are in fact benign and include inflammatory conditions as well as neoplasms. He concludes with advice that remains sound. 'It is a safe rule then to undertake no radical treatment until the microscope has finally settled the question.'

His account of the radiological characteristics of simple cysts, fibrous osteitis, myeloma (osteoclastoma), enchondroma and osteosarcoma give a clear guide to their diagnosis, and his descriptions of the presentation and pathological features of simple bone cysts needs few additions.

In the same year he addressed the Paediatric Section of the British Medical Association at Liverpool on 'Fibrous and Fibrocystic Disease of Bone'. He classified these into four types with their own clinical and pathological features (table I.) He illustrated the paper with the histories of five patients and discussed these in relation to his own views and to recent publications by Bloodgood and Silver in America. The American papers had been very detailed in their descriptions of the pathology and the clinical characteristics of the fibrous and cystic conditions that affect bone.

TABLE I

<i>1912 Classification</i>	<i>1914 Classification</i>	<i>1933 Classification</i>	<i>Present Terminology</i>
Localized fibrous osteitis	Localized fibrous osteitis	Diffuse fibrosis of bone	Monostotic fibrous dysplasia
Localized fibrous osteitis with cysts	Localized fibrous osteitis with cysts	Diffuse fibrosis of bone with cysts	Polyostotic fibrous dysplasia
Generalized fibrocystic osteitis	Generalized fibrocystic osteitis	Generalized diffuse fibrosis of bone	Simple bone cyst or metaphysial bone cyst
Simple bone cysts, usually solitary, rarely multiple	Simple bone cysts	Simple bone cysts	Aneurysmal bone cyst and other giant cell variants (Table II)
	Solitary cysts with giant cell tissue in the wall	Osteoclastomatous cysts	Osteoclastoma
	Cystic changes within a typical osteoclastoma	Cystic osteoclastoma	Hyperparathyroidism
	Osteoclastoma and cysts in association with generalized osteoporosis and multiple fracture	Hyperparathyroidism	

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But they had failed to correlate the two on a clinico-pathological basis and the classification that resulted was therefore unnecessarily confused in comparison to Elmslie's. He was able to strip the problem of all confusing detail and provide a practical classification that was at the same time pathologically correct, to guide the clinician. This ability was an essential quality of his genius.

In 1914 a major article appeared in the *British Journal of Surgery* in which he gave detailed descriptions of numerous cases and of specimens drawn from the literature and from many pathological museums. This must have been an enormous task but it provided the material from which he drew his conclusions on cystic and fibrocystic conditions of bone. He enlarged his classification of two years before (see table I) to include osteoclastomas. This introduced a difficult group, the apparently simple cysts which had numerous giant cells in their walls, and which he considered to be related to osteoclastomas. The problem of the giant cell in bone tumours has confused pathologists for many years, and only now is it widely appreciated that there are a number of bony tumours other than osteoclastomas that contain giant cells, including some simple bone cysts (Table II). This was a difficulty that Elmslie was never to solve. It seems most likely that his osteoclastomatous cysts were aneurysmal bone cysts.

The other mystery group in the 1914 classification was the last one, where giant cell tumours were associated with a diffuse fibrocystic disease of the whole skeleton. Here he gives a good description of the condition that was shortly to be recognized as hyperparathyroidism. In 1904 Askanazy had found a parathyroid tumour at a post mortem examination on a patient with generalized fibrocystic disease, but this observation was not clinically applied until 1926 when Mandl successfully removed a parathyroid tumour in a patient with this condition. A year later, in the Robert Jones Birthday Volume, Elmslie described two patients with generalized osteoporosis and multiple bone cysts associated with gross deformity, fractures and hyperostosis of the skull. He noted that the serum calcium was high in both of these patients and soon afterwards concluded that they might have parathyroid tumours. Finally in 1930 Sir Thomas Dunhill explored the neck of one of these patients and performed the first parathyroidectomy in Great Britain.

TABLE II

1. OSTEOLASTOMA
2. 'GIANT CELL VARIANTS'
 - a) Aneurysmal bone cyst
 - b) Simple bone cyst
 - c) Metaphysial fibrous defect
 - d) Benign chondroblastoma
 - e) Fibrous dysplasia
 - f) Hyperparathyroidism

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In his Presidential Address to the British Orthopaedic Association in 1930, Elmslie appropriately made a survey of pathology in relation to orthopaedic surgery which throws a revealing light on his brilliance in this field. He mentioned his case of hyperparathyroidism to stress the importance of metabolic studies in a full understanding of bone pathology. A more detailed review of their experience of hyperparathyroidism was published by Elmslie, Dunhill and others in 1933. This is based on a detailed and careful assessment of three patients who were followed for two years after parathyroidectomy, which confirms the ability of surgery to reverse the bony changes and so prevent recurrent fractures. The clinical and radiological features of the disease were well described and the biochemical findings discussed. A most important observation they make is that the serum calcium may not always be raised. They did however find that the urinary calcium was high in all three patients, and concluded that this was a more reliable test in doubtful cases especially if it is considered in conjunction with the calcium intake.

At Liverpool in 1933 he delivered the Lady Jones Memorial Lecture and made a retrospective study of his own personal views on fibrocystic diseases of bone. His classification included hyperparathyroidism (table I) for the first time.

His next task was to build up a clinico-pathological picture of generalized fibrosis of bone (fibrous dysplasia) so that it could be more easily distinguished from hyperparathyroidism. This was well described in the *St. Bartholomew's Hospital Reports* in 1935 where he remarked on the absence of any systemic changes such as bone pain and muscular weakness. He also discussed the importance of looking for the generalized radiographic rarefaction of the bones which is only present in hyperparathyroidism, and pointed out that although fibrosis of bone may involve the skull it does so in focal areas and does not produce a generalized hyperostosis. An interesting observation which had not been made before was that diffuse fibrosis may be monomelic or unilateral in its distribution. He went on to discuss the contemporary ignorance of the cause of diffuse fibrosis, there being no evidence of a generalized metabolic disturbance or nutritional deficiency. He considered it to be a disturbance of osteoblastic activity which resulted in a confused pattern of fibrous tissue, bone, osteoid and sometimes cartilage, while hyperparathyroidism was, by contrast a predominantly osteoclastic process. After thirty years our knowledge of its aetiology can still go no further than this.

Elmslie's final classification remains essentially unchanged apart from the group of giant cell variants and the substitution of the term 'fibrous dysplasia' for fibrosis of bone. This latter alteration adds nothing to our understanding of the nature of the condition but does help to differentiate it from other conditions in which fibrosis of bone occurs.

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REFERENCES

- ASKANAZY, M., Arbeiten auf dem Gebiet der pathologischen Anatomie und Bakteriologie aus dem pathologisch. Anatomischen Institut zu Tübingen, No. 4398, 1904.
BLOODGOOD, J. C., *Ann. Surg.*, 1910, 52, 145.
ELMSLIE, R. C., Jacksonian Prize Essay, 1905.

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- Idem.*, *St. Bart's Hosp. med. Rep.*, 1912, 43, 73.
Idem., *Brit. med. J.*, 1912, ii, 1367.
Idem., *Brit. J. Surg.*, 1914, 2, 17.
Idem., *The Robert Jones Birthday Volume*, Oxford University Press, 1928, p. 127.
Idem., *J. Bone Jt Surg.*, 1931, 13, 423.
ELMSLIE, R. C., FRASER, F. R., DUNHILL, T. P., VICK, R. M., HARRIS, C. F., and DAUPHINEE, J. A., *Brit. J. Surg.*, 1933, 20, 479.
ELMSLIE, R. C., *Lpool med.-chir. J.*, 1933, 61, 1.
Idem., *St. Bart's Hosp. med. Rep.*, 1935, 68, 147.
MANDL, F., *Zbl. Chir.*, 1926, 65, 2368.
PAGET, J., *Med.-chir. Trans.*, 1877, 60 37.,
SILVER, D., *Amer. J. orthop. Surg.*, 1912, 9, 563.

HARVEY, FOETAL IRRITABILITY—AND ALBERTUS MAGNUS

by

WALTER PAGEL

IN his classical *History of Embryology* Joseph Needham rightly accords credit to Harvey for having appreciated tissue irritability as independent of the nervous system before Glisson.¹ This is based on the seventeenth and the fifty-seventh chapters of the work *On generation of animals* (1651).² In the latter Harvey deals with *paradoxa* and *problemata*—in the first place that many things seem to happen in the *ovum* before anything of the embryo, nay even its first particle emerges.³ What then prevents us from believing that the innate heat and vegetative soul exist before the chick itself? On the other hand these are inseparable from the latter and, according to the famous Aristotelian definition of the soul, should be the act of an organic body that is potentially alive. A further *paradoxon* lies in the blood being formed, moved and endowed with vital spirit before any blood-forming or moving organs are in existence. *Nor is it less new and unheard of that sense and motion are in the foetus before the brain is built up: for the foetus is moved, contracts and unfurls itself at a time when at the place of the brain yet nothing is visible but clear water.*⁴

A little later Harvey supplements this, stating that even a light touch with a needle will elicit *obscure movements, contractions and contortions* like those of a worm or caterpillar in the very primogenital drop of blood before any trace of a body is discernible and the brain consists of nothing but clear water. Hence it obviously has sensation, and Harvey concludes that as we see motion and sensation to be present

¹ Cambridge, 1934, p. 123.

² W. HARVEY, *Exercitationes de generatione animalium*, quoted from ed. Amstelaedami, ap. I. Ravesteynium, 1662, p. 66; p. 242–245; tr. WILLIS, R., *The works of William Harvey*, London 1847, p. 239; p. 428–433; tr. *Anatomical exercitationes concerning the generation of living creatures*, London 1653, p. 94–95; p. 344–348.

³ *antequam quippiam pulli, vel ipsa primogenita ejus particula appareat; quidni utique credamus calorem innatum, animamque pulli vegetativam, ante pullum ipsum existere?* ed. 1662, p. 242.

⁴ *videtur praeterea paradoxon, Sanguinem fieri et moveri . . . antequam ulla organa sanguifica, vel motiva exstiterint. Nec minus novum, atque inauditum, inesse sensum ac motum in foetu, priusquam cerebrum exstructum fuerit: Movetur enim foetus, contrahit et explicat sese, cum pro cerebro adhuc nihil conspicuum est, praeter aquam limpida[m], ed. 1662, p. 243.*