LIV. THE DISTRIBUTION OF LEAD IN HUMAN BONES.

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It has been shown [Tompsett and Anderson, 1935] that lead occurs in appreciable amounts in the tissues of persons with no history of exceptional exposure to lead. The highest concentrations of lead were found in bones (rib and vertebrae). The concentration of lead in the rib varied from 5.2 to 12.9 mg. Pb per kg. (wet tissue) and in the vertebrae from 4.2 to 14.7 mg. Pb per kg. (wet tissue). Lynch *et al.* [1934], in an examination of human tibiae and femora, found 14–146 mg. Pb per kg. (wet tissue). It was decided therefore to compare the concentrations of lead in the rib, the vertebrae, the shaft of the femur and the shaft of the tibia. These bones were obtained from cases of widely different ages having no history of special exposure to lead.

EXPERIMENTAL.

A weighed portion of the bone (tibia and femur 1–2 g.; rib and vertebrae 10–20 g.) was dried and incinerated in a silica basin containing 100 ml. of lead-free sodium phosphate. Lead was then determined as described previously [Tompsett and Anderson, 1935].

Table I.

The results are expressed in mg. Pb per kg. fresh bone.

	Age	Occupation	Diagnosis	Rib	Verte- brae	Femur	Tibia
			Males.				
1	25	Quarryman	Nephritis	5.9	4.6	33.9	27.8
2	28	Newsagent	Aspirin poisoning	9.8	6.4	25.6	27.0
3	29	Clerk	Ulcers of small in- testine	4.2	4.6	21.1	20.6
4	35	Boiler fireman	Carc. of stomach	13.3	7.3	48.2	28.6
5	50	Hairdresser	Carc. of stomach	7.9	4.6	48.1	42.1
6	58	Labourer	Nephritis	8.9	8.6	29.0	26.5
7	59	Engineer	Uraemia	12.8	11.6	70.0	62.7
8	66	Iron moulder	Carc. of pelvic colon	8.6	6.5	42.3	48.6
9	67	Retired	Cerebral haemorrhage	9.1	8.2	55.9	43.7
10	67	Retired	Fractured skull	11.1	12.4	108.3	96.5
11	68	Blacksmith	Carc. of bronchus	11.3	7.6	74.1	43.4
12	74	Restaurant proprietor	Coronary thrombosis	13.4	12.6	82.2	81.6
			Females.				
13	12	—	Malignant thymoma	4.0	3.4	19.1	17.9
14	19	Shop assistant	Subacute bacterial endocarditis	16.5	10.6	74.8	60.0
15	22	Clerk	Pernicious anaemia	7.2	6.2	18.2	15.3
16	30	Housewife	Burns	9.5	8.4	34.1	29.8
17	39	Housewife	Subacute bacterial endocarditis	9.8	10.6	44.5	46.8
18	49	Housewife	Toxic goitre	8.7	9.0	33.3	27.8
19	61	Housewife	Abscesses of the kidneys	17.5	16.5	61.7	61.5

The pink colours developed with diphenylthiocarbazone are quite stable unless exposed to bright sunlight when rapid fading will take place.

The results are shown in Table I.

From the results it will be seen that femora and tibiae contain much higher concentrations of lead than ribs and vertebrae. The concentrations of lead in tibiae and femora appear to be of the same order and agree with those reported by Lynch *et al.* [1934]. It seems that in cases of suspected lead poisoning, different types of bone should be examined.

SUMMARY.

1. Femora and tibiae contain much higher concentrations of lead than ribs and vertebrae.

2. In a series of 19 cases, the concentrations of lead were, rib 4.0–17.5, vertebrae 3.4–16.5, femur 18.2–108.3, tibia 15.3–96.5 mg. Pb per kg. fresh bone.

In conclusion I wish to thank Dr A. B. Anderson for his helpful criticism and advice.

REFERENCES.

- Lynch, Slater and Osler (1934). *Analyst*, **59**, 787.
Tompsett and Anderson (1935). *Biochem. J.* **29**, 1851.