show that the basis of the law is some change in the proteins of the muscle, which respond

FIG. 1. Frog's heart killed by heating to 50° C. (*Rana tigrina*). Effect of stretching on the tension produced by heating to 70° C. Note that the last contraction is about double the first. The length was increased by 3-4 per cent. each time.

by more forcible contraction, if they are stretched.

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DISTRIBUTION OF RADIOACTIVITY IN THE KHONDALITES OF ANDHRA STATE

KHONDALITE series are extensively developed in the Eastern Ghats. A typical khondalite essentially consists of quartz, felspar, garnet, sillimanite and graphite with magnetite, apatite and rutile as accessories. Khondalites are intruded by charnockites and pegmatites resulting in the development of a complex group of interaction rocks. Beta-activity was determined, according to a method earlier outlined,[1] for 36 specimens of khondalites drawn from Krishna, Godavari, Visakhapatnam and Srikakulam Districts (16° 30′ E to 19° 30′ E and 80° 36′ to 83° 42′) of Andhra State.

The radioactivity data on khondalites are studied from three mutually-related aspects—(*i*) mineralogical constitution and radioactivity, (*ii*) associational characteristics and radioactivity, and (*iii*) radioactivity and petrogenesis.

(*i*) It is found that an increase in the radioactive content can be correlated to an increase in the total content of garnet and sillimanite and a decrease in the content of quartz. It appears that the high radioactivity in khondalites is associated with heavy minerals—mostly garnets and sillimanite, which is supported by the correlation between the radioactive content of and the percentage of heavy minerals in the khondalites (Table I).

TABLE I

Heavy mineral content and radioactivity

Specimen No.	Percentage of heavy minerals in the rock	Radioactive content (in ppm. of U)
2	73·38	12·86
7	60·72	8·72
21	43·57	4·09

As can be expected,[1] specimens of khondalites which bear evidences of later felspathisation are characterised by a higher radioactivity than the non-felspathised ones.

(*ii*) The mode of association of khondalites seems to have a profound influence on the distribution of radioactivity in the rocks. While the association of khondalites with pegmatites, charnockites and interaction rocks seems to enhance the radioactivity of the former, occurrence in the proximity of calc-granulites, quartzites and quartz-veins appears to depress it (Table II).

TABLE II

Associational characteristics and radioactivity of khondalites

Nature of association	Number of specimens examined	Mean radio active content (in ppm. of U)
Pegmatites	2	16·96
Charnockites	4	10·50
Interaction rocks	8	10·41
Calc-granulites	2	7·94
Quartzites and quartz veins	6	7·11

(*iii*) The high radioactivity of khondalites (9·32 ppm. of U) is visualised as a manifestation of either or both of the two processes. hypo-metamorphism, and adsorption of radioactive matter in the colloidal phase. Khondalites were subjected to hypo-metamorphism[2] and it is possible that the extreme conditions of temperature and pressure under which such a process took place, might have facilitated the dissemination of radioactive matter into the khondalites.[3] Alternately, it can be surmised that the colloidal clayey and organic components of khondalites were instrumental in chemically adsorbing uranium from ocean waters at the time of deposition.[4-6] Of the two possibilities, the second one is more probable, but it cannot be ruled out that both might have participated to bring about the present distribution of radioactivity in khondalites.

It is suggested that radiometric work in areas where khondalites are rich in argillaceous and carbonaceous components may bring to light significant sources of uranium.

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EFFECT OF IONIC SIZE, CHARGE AND VALENCY ON DONNAN DIFFUSION IN CATION-EXCHANGE MEMBRANE

IN a previous publication[1] the variation in chloride uptake by two samples of cation-exchange membranes in hydrochloric acid, sodium chloride and barium chloride solutions was reported This note describes the results obtained with Nepton CR-51 cation-exchange membrane in different salt solutions.

The membrane was converted to the different salt forms for determining the amount of chloride absorbed by the Donnan diffusion process The determinations were carried out in a manner similar to that reported earlier.[2]

In Fig. 1, the ratio of the amount of chloride absorbed by the membrane (N_A) to the external chloride concentration N_A/N_{Ext} is plotted

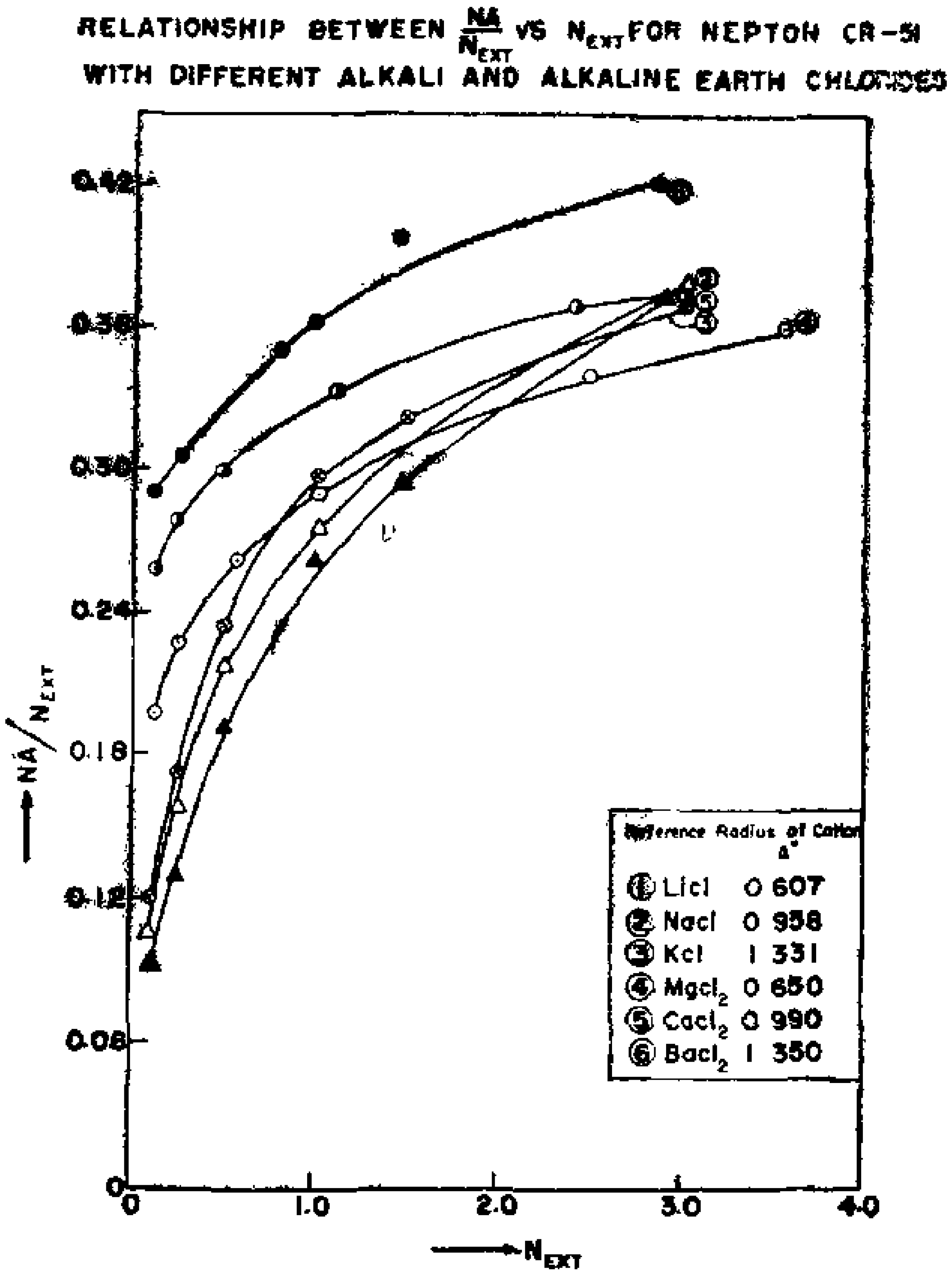

FIG. 1

against the external chloride concentration (N_{Ext}). The results reveal that among the divalent alkaline earth salts the uptake of chloride is highest with barium chloride (cation radius 1·35 Å) and lowest with magnesium chloride (cation radius 0·65 Å). Similarly, among the alkali salts reported in this note, the uptake of chloride is found to be highest with potassium chloride (cation radius 1·33 Å) and lowest with lithium chloride (cation radius 0·607 Å). The effect of charge and valency of the cation on the chloride uptake by the cation exchange membrane is revealed by the difference in the amount of anion absorbed when using barium chloride (divalent and of ionic radius 1·35 Å) and potassium chloride (monovalent and of ionic radius 1·33 Å) solutions. Thus, the quantity of anion diffusing into the cation-exchange membrane is seen to depend on the ionic radius of the cation, and among cations of almost similar ionic radii their charge and valency govern the quantity of anion diffusing into the membrane.

Full details of the work will be published elsewhere.

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