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A NEW RESULT OF G.A. EDGAR ON REPRESENTING POINTS IN A CONVEX BOUNDED SUBSET OF BANACH SPACES WITH THE RADON-NIKODYM PROPERTY AS BARYCENTRES OF RADON MEASURES

by

P. MANKIEWICZ

A well-known theorem of Choquet states that if  $K$  is a convex metrizable compact in a locally convex space then for each  $x \in K$  there exists a Borel measure  $\mu$  supported by the set  $\text{Extr}(K)$  (i.e. extremal points of  $K$ ) such that

$$x = \int_K \text{Id} \, d\mu \quad (\text{Id stands for identity map}).$$

Two years ago, Edgar proved the following

Theorem: If  $K$  is a convex closed bounded subset of a Banach space with the RNP then for each  $x \in K$  there exists a Borel measure  $\mu$  supported by  $\text{Extr}(K)$  such that  $x =$

$$= \int_K \text{Id} \, d\mu$$

The case when  $K$  is non separable remained open. Recently, Edgar has defined a partial order relation  $\rightarrow$  between measures defined on a given convex set such that we have the following:

Theorem (Edgar): If  $K$  is a closed convex bounded subset of a Banach space with the RNP, then for each  $x \in K$  there exists a Radon measure  $\mu$  on  $K$ , maximal with respect to  $\rightarrow$  such that  $x = \int_K \text{Id} \, d\mu$ . If in addition  $K$  is separable

then "maximal measure" means just the same as "supported by extremal points of  $K$ ".

In general (i.e. when  $K$  is not separable) it could happen that the support of a maximal measure is disjoint with the set of extreme points of  $K$ . This has been shown by an example due to W.J. Davis, G.A. Edgar and W.B. Johnson.