INTRODUCTION

By a well-known theorem of group theory, every finite group has, up to isomorphism, just one representation as a direct product of indecomposable subgroups; the theorem is known to hold for groups both with and without operators.[1] One of the main achievements of this work is an extension of the result just mentioned to finite algebraic systems of an arbitrary nature; the only restrictions imposed are those which, roughly speaking, enable us to define for these systems an adequate notion of a direct product.[2] Moreover, we succeed in establishing a few further theorems on direct decompositions with finite factors (cf. the exchange theorems, the refinement theorem, and the cancellation theorem in Section 3), which do not seem to be known in the literature even in their application to groups. To obtain these results, we have to undertake a rather detailed discussion of the notions of center and central isomorphism, which are familiar from group theory but have not heretofore been applied to arbitrary algebras. The results presented here can be extended to certain classes of infinite algebraic systems. Some remarks to this effect will be found in the text; a detailed discussion of these extensions will be left, however, for a later publication.[3,4]

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1. For groups without operators compare Maclagen - Wedderburn [1] and Remak [1] ; the result is also presented in Speiser [1] , pp. 135 f. For groups with operators see Schmidt [1] where the theorem is also proved for certain infinite groups; another proof is given in Fitting [1] .

2. The main result of this work has been announced (without proof and in a much less general form) in Jónsson-Tarski [1] .

3. For general information in the domain of modern algebra consult Birkhoff-MacLane [1] and van der Waerden [1] ; see also Birkhoff [2] . For notion and results applying to special kinds of algebras (like groups, rings, and lattices) compare in addition Birkhoff [1] , Jacobson [1] , and Speiser [1].

4. The results of B. Jónsson contained in this work constitute the essential part of his doctoral dissertation submitted to the University of California.