ations used in the book, an index of authors of works cited, and an index of institutes referred to in the body of the book.

Although it is disappointing to note the perpetuation of errors and deficiencies noted previously in the first edition, it should be pointed out that this new edition does serve as a valuable supplement to the FMRC *Index*, particularly with respect to the listing of publications that have appeared since about 1961.

J. W. W.

1. A. Fletcher, J. C. P. Miller, L. Rosenhead & L. J. Comrie, *An Index of Mathematical Tables*, second edition (in two volumes), Addison-Wesley, Reading, Mass., 1962. (See *Math. Comp.*, v. 17, 1963, pp. 302–303, RMT **33**.)
2. *MTAC*, v. 10, 1956, pp. 100–102, RMT **34**.
3. J. A. Greenwood & H. O. Hartley, *Guide to Tables in Mathematical Statistics*, Princeton Univ. Press, Princeton, N. J., 1962. (See *Math. Comp.*, v. 18, 1964, pp. 157–158, RMT **13**.)

57[A, K].—Rudolph Ondrejka, *The First* 100 *Exact Subfactorials*, ms. of 9 pp. (handwritten) deposited in the UMT file.

The subfactorial of n, designated here by the symbol $n¡$ following the notation of Chrystal [1], is most commonly associated with the number of derangements of n objects so that none is in its original place. This interpretation yields the well-known formula

$$n¡ = n! \sum_{k=0}^{n} (-1)^k/k!,$$

which implies the useful recurrence relation $n¡ = n(n-1)¡ + (-1)^n$.

The author has thereby calculated the present carefully checked table of the exact values of the first one hundred subfactorials, which appears to be by far the most extensive tabulation of its kind.

Examples of previous compilations are to be found in books by Whitworth [2] and by Riordan [3]. These extend to only $n = 12$ and $n = 10$, respectively.

J. W. W.

1. G. Chrystal, *Textbook of Algebra*, 6th ed., Chelsea, New York, 1952, Vol. II, p. 25.
2. W. A. Whitworth, *Choice and Chance*, 5th ed., Bell, Cambridge and London, 1901, p. 107.
3. J. Riordan, *An Introduction to Combinatorial Analysis*, Wiley, New York, 1958, p. 65.

58[G, H, X].—Frank S. Cater, *Lectures on Real and Complex Vector Spaces*, W. B. Saunders Co., Philadelphia, Pa., 1966, x + 167 pp., 24 cm. Price $5.00.

This is an abstract development, some of which is considered suitable for undergraduates, and all of it for first-year graduates. The presentation is quite condensed and an amazing amount of material is covered.

There are five "Parts," the first, on "Fundamental Concepts," consists of three "Lectures." The Maximum Principle and the Axiom of Choice are stated and their equivalence asserted. Other topics include the factorization of polynomials and the definition of vector spaces and linear combinations. The remaining Parts are made up of six or seven Lectures each, and each Lecture is followed by a page or more of problems. The Cayley-Hamilton Theorem and the Jordan normal form occur in Part 3. Part 4 deals with infinite-dimensional spaces and operator algebras; Part 5 with finite-dimensional unitary spaces.

As a text for presenting an abstract development the book should do very well. As a reference book for the numerical analyst who needs to look up something about matrix theory there are more accessible sources.

Not many misprints were noted, but on p. 123 "the contraction of M" appears as "the contradiction of M."

A. S. H.

59[G, H, X].—PAUL A. WHITE, *Linear Algebra*, Dickenson Publishing Co., Inc., Belmont, Calif., 1966, x + 323 pp., 24 cm. Price $8.50 (Text List), $11.35 (Trade List).

This is a carefully written, introductory text. It contains all of the material essential to such a text. The subject is introduced concretely, using ordered n-tuples, after which geometry is done within this context. Abstract, finite-dimensional, vector spaces are then developed, followed by matrices and linear transformations. Attention is paid to congruence and similarity invariants (Jordan forms, minimal polynomials, etc.). The geometric content of the subject is emphasized throughout. The logical structure is clear, since the definition-theorem-proof approach is used. Finally there are many worked-out examples, as well as a varied selection of exercises.

One apparent bonus at this level, is the introduction of the exterior product $\mathbf{u}_1 \wedge \cdots \wedge \mathbf{u}_k$, for $\mathbf{u}_i \in V$, an n-dimensional space. Unfortunately, in this reviewer's opinion, this noble attempt fails. First, the definition is very much dependent on coordinates, hence highly computational and unmotivated. Next, the definition is not standard, nor even unique, since if $\mathbf{e}_1, \cdots, \mathbf{e}_n$ is the usual basis in coordinate space, $\mathbf{e}_{i_1} \wedge \cdots \wedge \mathbf{e}_{i_k} \wedge (i_1 < \cdots < i_k)$ is defined only up to a multiplicative constant $c_{i_1 \cdots i_k}$, which leads to complications when the author speaks of "the" exterior product. Furthermore, the author (uncharacteristically) neglects to state $c_{i_1 \cdots i_k} \neq 0$ —clearly required if the usual results on linear dependence are to hold.

According to the author, the book follows the CUPM recommendations for a linear algebra course. The material has been used in NSF Institutes and in regular undergraduate classes, and despite the above objection, it is easy to believe that it proved highly successful.

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60[K].—M. J. ALEXANDER & C. A. VOK, *Tables of the Cumulative Distribution of Sample Multiple Coherence*, Research Report RR 63–37, Rocketdyne Division of North American Aviation, Inc., Canoga Park, Calif., November 1963, nine volumes totalling 5440 pp., 32 cm. Price $50.00 (not postpaid).

The multiple coherence parameter plays a role in spectral analysis of multidimensional time series analogous to that of the squared multiple correlation coefficient in multivariate analysis. In fact, these tables can be used for the latter under the conditions described below.