and prove themselves" (p. 89). Artistic experience may be a datum of science; scientists may at times think and feel like artists, and perhaps it would be better if they did so more often; but as a social enterprise, science has its own agenda that is different from that of the arts.

The unconceptualized evocation of "suchness"—of unique, concrete experience—is surely the home ground of the arts; to claim it for science too is to promote confusion rather than holism. The lessons of past successes and failures in science surely indicate that, desirable as good communication between the sciences and the arts may be, differentiation of their roles is essential. The time for such fusions as Goethe's *Naturphilosophie* is past. In the limited but humanly important agenda of science, exhortatory and evocative statements like the following would seem to be out of bounds: ". . . It looks probable that the full, ultimate 'Truth' is finally definable, only and altogether, by all the other ultimate values. That is, truth is ultimately beautiful, good, simple, comprehensive, perfect, unifying, alive, unique, necessary, final, just, orderly, effortless, self-sufficient, and amusing" (p. 123). Here we would seem to be leaping from science *and* art squarely into theology.

In personality psychology, where his primary concerns lie, Maslow calls in effect for more emphasis on what Gordon Allport termed an *idiographic* approach of faithful phenomenological description, in contrast with the *nomothetic* one that seeks abstracted and lawful generalizations. Allport's exposition of this distinction (*2*)—drawn from the German philosophers of the *Geisteswissenschaften*—is more cautious and sophisticated; Maslow cites but does not discuss Allport's views, and he pays no heed to the extensive critical discussion—as, for example, by R. R. Holt (*3*)—that they have received.

In his preface, Maslow notes that the discursive style appropriate to a lecture gave him leeway to be casual and personal; he disclaims "any systematic effort to document my theses," to " 'cover the subject,' or to be scholarly in a comprehensive or systematic way" (p. xvi). That is honest, but the fact that he has used this license is too bad. The issues deserve more responsible treatment. There is a rising tide of concern, in the Congress and elsewhere, about the pretensions and methods of a science that is aimed at the prediction and control of human behavior and often deals manipulatively with the subjects of its investigations. There is serious question whether prevalent methods of personological and social research pay sufficient regard to human dignity and integrity; whether prevalent theories provide an adequate framework for conceptualizing the experiencing person and the responsible citizen; and whether in the difficult and sensitive realm of human behavior the forms and rituals of science may not too often have taken priority over its spirit.

A strong case can be made that a more collaborative, less manipulative approach to the study of people is needed; and that a desirably humanized science of personality and social behavior might result. Toward such ends, effective spokesmen for a humanized psychology are needed in the arena of scientific controversy. My complaint about Maslow's book is that it is too unclear about the location of the arena and about the rules of the game to get taken seriously by those who are committed to a science of man.

References

1. A. Koestler, *The Act of Creation* (Macmillan, New York, 1964).
2. G. W. Allport, *Personality: A Psychological Interpretation* (Holt, New York, 1937).
3. R. R. Holt, "Individuality and generalization in the psychology of personality," *J. Personality* **30**, 377 (1962).

Early Meteorology

A History of the Theories of Rain (Watts, New York, 1966. 231 pp. Illus. $5.95) is a well-written and fascinating account of the development of ideas about wind and weather from the earliest recorded times to the end of the 19th century. Its author, W. E. Knowles Middleton, is a distinguished research meteorologist and science administrator who has already proven his competence as a historian of science with a book on the history of the barometer. He utilizes original sources almost exclusively, he interprets keenly, and most of what he has written is original and therefore of interest to scientists and laymen equally.

The present book provides both more and less than is promised by the title. The subject is brought only to 1900, short of the point where it begins to assume greater interest and importance to present-day readers. Virtually all of modern cloud physics is omitted. On the other hand, the scope is considerably broader than may be implied by the phrase "theories of rain." It encompasses pressure change, winds, electrical and chemical effects, and water-vapor and phase changes, as well as clouds, dew, hail, frost, and the direct processes leading to rain.

Especially illuminating is Middleton's account of the interweaving of ideas about clouds and water vapor, both right and wrong, within the fabric of the scientific thought of the 18th and 19th centuries. We find that Dalton, Descartes, Boyle, Poisson, Kelvin, and others thought deeply about atmospheric problems and their relation to laboratory experiments, and that they engaged in spirited and long-continued debate with men who today are less well known: Jean André Deluc, Pieter van Musschenbroek, and Heinrich Wilhelm Dove, for example. We learn that the concepts of adiabatic temperature change and of the effect of turbulence on the vertical distribution of gases, so crucial to an understanding of cloud behavior, eluded the most acute minds for many years. And we learn that as early as the first half of the 19th century, a proposal for large-scale weather modification was presented to the federal government. This scheme, due to James Pollard Espy, was based on an exaggerated view of the importance of vertical convection. Espy proposed to burn each week in the western United States 40 acres for every 20 miles along a 600- to 700-mile line, thus initiating a large-scale storm which would sweep across the entire continent, presumably bringing great benefits to towns and farms along its path. Fortunately, it was never endorsed or implemented by Congress.

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Agronomy

The Growth of Cereals and Grasses (Proceedings of the Twelfth Easter School in Agricultural Science, University of Nottingham, England, 1965. F. L. Milthorpe and J. D. Ivins, Eds. Butterworth, Washington, D.C., 1966. 370 pp. Illus. $19) consists of a series of review articles. Most of the con-

tributors are British or European but Australia, New Zealand, and Canada are also represented. The editors are professors of agricultural botany and agriculture, respectively, at the University of Nottingham. The contents are arranged in six general categories: vegetative development, reproductive development, the environment, responses to the environment, biochemical aspects of quality, and agronomic aspects. Most of the 22 papers are of an agronomic nature or have an agronomic orientation toward morphological or physiological aspects of plant growth. Considered from a botanical standpoint, the primary emphases of the papers are as follows: 6 are morphological, 11 physiological, 3 agroecological, and 2 agronomic.

The morphology papers are primarily developmental in approach. Such a paper is "Development of the inflorescence in Gramineae" by R. F. Williams. D. M. Calder discusses "Inflorescence induction and initiation in the Gramineae." A subject of general interest is covered by P. S. Wellington in his article "Germination and seedling emergence." One of the papers on physiology is "Mineral nutrition of grasses and creals" by R. H. M. Langer.

Although it seems unnecessarily expensive, the book is attractively bound and printed. It should prove helpful as a reference work for agricultural scientists and others interested in grasses.

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Faunas of Tennessee

Upper Cambrian Trilobite Faunas of Northeastern Tennessee (Smithsonian Institution, Washington, D.C., 1965. 150 pp., $3) by Franco Rasetti, constitutes a significant contribution to the knowledge of Upper Cambrian trilobite taxonomy and biostratigraphy of the *Cedaria, Crepicephalus,* and *Aphelaspis* faunas.

To accomplish his intent "both to describe the fossils and to present them in their proper setting," Rasetti collected trilobite faunules, almost literally bed-by-bed, from 21 stratigraphic sections in eight Tennessee counties and from one bordering county in Virginia. No map of any sort is provided, but the geographic position of each *collection* is identified by coordinates in millimeters, measured from the southeast corners of 14 recent U.S. Geological Survey 7½-minute quadrangles. This makes it possible for future workers to return precisely to Rasetti's localities, a spectacular advance in providing critical information, but to fully appreciate the geographic relationships of the collections, the reader would need a ballroom or a basketball court as a map table.

The elaborate coding system invented by Rasetti for identifying each collection presages trouble in the future. Not only is the system an invitation to copying and typographical errors (cnn/4, cnq/4, cnq′/4, cnq″/4, cnr/4, cnr′/4), it conveys subjective conclusions. In Rasetti's words, "it was attempted to designate by the same letters correlative beds in the different sections," and "collections designated by cna to cne belong to the *Cedaria* zone, cnk to cnn to the *Crepicephalus* zone, and cno to cnx to the *Aphelaspis zone.*" Furthermore, "the letters cn (for Cambrian, Nolichucky)" are applied also to collections declared by Rasetti to be from the Maryville formation (cnc/2 to cnc/5). Both formational and zonal assignments are individual judgments, almost universally under debate and inherently ephemeral. Identification of basic data should be as objective as possible.

Rasetti has described and illustrated 82 named species, 32 of them new, assigned to 39 genera, 4 of them new; a residuum of 11 undetermined species that are assigned to genera, 2 undetermined cranidia, and 2 undetermined pygidia complete the systematics. The plates are esthetically pleasing, and the photographs meet Rasetti's high standards, but his sharp lighting—which results in excellent modeling—preserves detail only in the middle tones. Although Rasetti has intimated elsewhere that he has taken stereophotographs, there are none in this publication. Many specimens are illustrated by three views; in my opinion a stereo pair gives a far better impression of the relationships of the parts to the whole.

Unhappily Rasetti follows A. R. Palmer, who stubbornly refuses to cite properly his paper on the faunas of the Riley formation in central Texas. The verso of the title page of volume 28 of the *Journal of Paleontology* records the fact that No. 6 (November 1954) was mailed 15 January 1955, and that date, according to the International Code of Zoological Nomenclature, is the date of origin of Palmer's new taxa. Research on these Croixan faunas is active, and already Palmer's taxa have been cited as either 1954 or 1955 in several papers.

Rasetti makes considerable use of physical association of specimens, and their stratigraphic distribution, to assess morphologic variability characteristic of a taxon. With this practice I heartily agree.

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Marine Isopods

Handbook on the Common Marine Isopod Crustacea of Georgia (University of Georgia Press, Athens, 1966. 101 pp. Paper, $2.50) by Robert J. Menzies and Dirk Frankenberg is an attractive small volume intended for the use of senior students and investigators. It is the first such work to be based on the invertebrate collection made by the great collector, Milton B. Gray, for the Sapelo Island Foundation.

The authors have abridged their volume by leaning heavily on clear line drawings. In a six-page artificial key, many references are made to a plate of figures illustrating key characteristics. Also, 27 pages of figures are used to supplement the diagnoses of 30 species of isopods, including ten new species. A map and a six-page station list show collection stations off the coast of Georgia. There is a brief discussion of the distribution of the 30 species; Forbes's concept of twin Atlantic and Pacific species formerly used for decapod Crustacea is applied to the Isopoda and demonstrates that there are closely related species in both oceans. There is a good working bibliography.

In their systematic treatment, the authors admit that they have compensated for their "extraordinarily short" species diagnoses by using a considerable number of descriptive illustrations. I feel that their diagnoses definitely need more textual explanation, because, as the authors themselves indicate for such stalwarts of crustacean taxonomy as Stimpson, Harger, Richardson, and Barnard, differences of interpretation may result from illustrations not accompanied by adequate textual descriptions. Also, although maps and extensive sta-