cian equator inclined 70 degrees with respect to the present one, the Ordovician tropics having passed through what are now Ecuador, Panama, Newfoundland, central Russia, and East Pakistan. South America and Africa would thus have to have been widely separated, in contrast to the later Gondwana configuration accepted by many, and Fell's equator would pass through the position of the Ordovician Gondwana Pole as recently computed by Fairbridge. Why didn't Fell discuss his subject in the light of polar wandering curve superpositions, analysis of diversity gradients such as those Stehli studies, or even concepts of sea floor spreading available when his article was written? The article is virtually nonquantitative in spite of abundant and suitable data. Kühne's paper is marred by muddy philosophy of systematics, violations of the Code of Zoological Nomenclature (*nomina nuda*), and various inadequately documented assertions (trends to increase the number of cheek teeth in several supposed lineages, reference to upper cheek-tooth formulas of *Paulchoffatia*, and others). Kühne's figure 3 appears to be of a single specimen, not three. These are matters that should have been rectified by the editor if not by the author.

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Complexities of a Provincial Scientist

John Dalton and the Progress of Science. Papers presented to a conference, Manchester, England, 1966, to mark the bicentenary of Dalton's birth. D. S. L. CARDWELL, Ed. Manchester University Press, Manchester; Barnes and Noble, New York, 1968. xxii + 352 pp., illus. $9.50.

The bicentenary of John Dalton's birth was celebrated in Manchester in September 1966 by two conferences. One was intended primarily for specialists in the history of science; the other was more general and aimed at the public. The papers from both these conferences make up the present volume.

The essays gathered together here are most successful in destroying what I think may be called the myth of John Dalton. This is the Dalton one usually meets in science textbooks or popular histories — the simple, self-educated Quaker drawing his inspiration and most of his knowledge from Newton's *Principia* and *Optics*, developing his epoch-making theory almost in an intellectual vacuum and failing to understand the full implications of what he had created; retaining his simplicity even at Manchester as a schoolteacher, and dying as the scientific world swept by him. The Dalton one meets in this volume is a much more complicated and scientifically sophisticated person, and both his milieu and his understanding of it are shown to be much more complicated than the myth would have it. His appreciation of the implications of what he had done and his struggles to avoid having his atomic doctrine swallowed up in others' theories are also delineated with skill and sensitivity.

The general level of the articles is very high indeed, which makes it impracticable to single out individual authors and titles for praise. Let me just strongly urge all historians of science and others interested in Dalton and the origin of the atomic doctrine to purchase the book and enjoy themselves reading it.

The one serious criticism I would make is of the quality of the illustrations. This really affects only one contribution, that by Kathleen R. Farrar on "Dalton's scientific apparatus." This worthy article, which successfully destroys the myth of Dalton as a founding member of the "ink bottle, beeswax, and string" school of British science, is accompanied by some of the muddiest figures and plates I have ever seen. Details are impossible to discern in the figures, and plate IVa is simply a jumble of flasks and barometers and what have you. Plate Va, to which reference is made in the text (p. 180), simply does not exist. Plate V itself appears opposite page 171, and for 150 pages I thought that it had been mistakenly included from another volume published by the Manchester University Press. It is of "The internal structure of a segment of a receptor from the retina of the rhesus monkey as seen under the electron microscope." It was not until page 322 that the plate was linked up to Dalton's colorblindness.

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Biological Variability in Man

La Diversité Humaine en Afrique Subsaharienne. Recherches Biologiques, Etudes Ethnologiques. JEAN HIERNAUX. Editions de l'Institut de Sociologie, Université Libre de Bruxelles, Brussels, Belgium, 1968. 261 pp., illus.

In this interesting monograph, Jean Hiernaux assesses the distribution of a number of monogenic and polygenic features in African peoples that inhabit regions south of 22°N latitude. He uses sophisticated statistical techniques to express the patterns of human variability and the taxonomic distance between populations and to test correlations between certain phenotypic and genetic traits and selected climatic factors.

The features chosen for detailed study include 10 gene frequencies (I^A, I^B, I^0, R_0, R_1, R_2, $r + R_0{}^u$, L^M, Hb^S, and Hb^C), the frequencies of arches, loops, and whorls on the fingers, and 18 traditional anthropometric dimensions. The biometric features are considered to be multifactorially determined while the biomolecular traits are controlled by simpler genetic mechanisms.

Hiernaux computes the coefficients of correlation between the mean values of the gene frequencies and morphological dimensions and between these features and each of six climatic factors—mean annual rainfall, mean value of humidity in the wettest month, mean value of humidity in the driest month, mean daily temperature in the hottest month, mean daily temperature in the coldest month, and mean altitude. Further, he uses partial coefficients of correlation strategically to test independently the possible effects of each climatic factor.

In general, Hiernaux found that the biometric traits exhibit higher correlations with mean annual rainfall and maximum temperature in the hottest month than with other climatic factors. By contrast, the biomolecular and dermatoglyphic traits generally do not evidence such notable correlations with major climatic factors. Thus, in explaining ABO and abnormal hemoglobin distributions, Hiernaux places primary emphasis on disease vectors and other microclimatic factors instead of on gross climatic factors. He believes that human phenotypes are notably subjected to selective forces of the environment and that even in instances where rather recent admixture has occurred, the descendant populations may reflect,