Most of the volume, however, is devoted to more recent time. In this part, which begins with a charming and informative address by Richard Bright, passes to the profound and visionary ideas of Billroth, and on through Pepper and Welch and Osler to the present day, the minds of thoughtful teachers are paraded to edify those of us who are too confident that we have found something new. American readers will be particularly grateful that a lengthy excerpt from John Morgan's "Discourse upon the institution of medical schools in America" has been included.

By gathering together these documents and the accompanying biographic concordance, Wartman has done a particular service for medical teachers who seek some rule against which to measure themselves, but it is surely not they alone who will find in this small volume a rich lode.

GEORGE E. MILLER
College of Medicine,
University of Illinois, Chicago

Myth, Obsession, Quarry?

Abominable Snowmen: Legend Come to Life. Ivan T. Sanderson. Chilton, Philadelphia, Pa., 1961. xviii + 525 pp. Illus. $7.50.

This is an amazing book. The author, a well-known naturalist, is convinced that there are four types of "Abominable Snowmen" living today, spread out over five continents. These are (i) "sub-humans" (found in East Eurasia and the Orient) of "standard man size," at least some of which may be Neanderthalers; (ii) "proto-pigmies" (inhabiting the Orient, Africa, and possibly Central and Northwest South America), smaller than the average man; (iii) "neo-giants" (occurring in Indo-China, East Eurasia, North America, and South America), taller than the average man by at least a foot or two; and (iv) "sub-hominids" (confined to South Central Eurasia), "in every way the least human," including the original Abominable Snowman, the much-discussed and disputed *Meh-Teh* of the Himalayas.

Unfortunately, the author's concept of what constitutes scientific evidence will scarcely be accepted by most scientists. His standards are unbelievably low. Indeed, his entire argument is based upon two types of evidence, namely, footprints and reports (many of which are obviously of questionable reliability). To these may be added some hand skeletons of doubtful provenance and supposed snowmen scalps which, it has been shown, come from the skin of the serow, a goatlike animal.

It would be foolish, and quite unscientific, to state categorically that creatures of the sort described in this book simply cannot exist. But the burden of proof rests not, as Sanderson obviously believes, on the shoulders of those who do not accept the current "evidence" of their existence. It rests upon the shoulders of those who affirm their existence. And the evidence which Sanderson presents is anything but convincing.

The author evidently is so firm in his belief that he passionately lashes out against those who do not go along with him. He has no use for those whom he terms "experts" or, apparently, for most fellow zoologists. For him, "Most of the skeptics are crackpots, yakking away in a vacuum of make-believe." Indeed, Sanderson gives the distinct impression that he feels there is a sort of conspiracy among zoologists against the chosen few who *know* that Abominable Snowmen are real creatures, not figments. But he believes that the "skeptics" have finally had to give way "to intelligent appraisal by honest men."

I wish that I could at least recommend this book as good, interesting reading. However, although it is written in a rather breezy, journalistic style, I have found it tediously repetitive and long-winded.

As I have already indicated, it is possible that some of Sanderson's "Abominable Snowmen" may actually exist. But valid proof of their existence is not to be found in this book.

WILLIAM L. STRAUS, JR.
Department of Anatomy,
Johns Hopkins University

A New Routine Tool?

Direct Methods in Crystallography. M. M. Woolfson. Oxford University Press, New York, 1961. viii + 144 pp. Illus. 30s.

Crystallography, or, more exactly, the method of crystal structure determination by x-rays, depends on Fourier transforms to obtain a picture of the atoms and molecules from the intensities of scattered radiation. However, as the information about the *phase* of the scattered waves is lost, the method is by no means straightforward, resembling the solution of a huge crossword puzzle. Until recently, the solution of a structure remained an art or intellectual exercise rather than a routine. Various more or less indirect methods have been developed to solve this *phase problem.* They are those of trial and error, the Patterson function, the heavy atom, isomorphous replacement, anomalous scattering, and the like. Direct methods aim at a general solution by a sequence of steps in which any decisions are of purely mathematical nature. They thus threaten to turn x-ray crystallography into another routine tool, such as the microscope. Whether this is a good or a bad thing is left to the reader to decide.

Woolfson's book describes all that is known about direct methods, developed by a handful of devoted avant-garde, up to about 1961. However, as frankly stated in the preface, this monograph is not recommended for the stranger or the comparative newcomer to the field; indeed, a more unsuitable avenue of approach to the subject of crystallography could hardly be imagined. However, to the seasoned crystallographer anxious to add to his armory for solving crystal structures, direct methods have much to offer.

The first part of the book treats simpler direct methods which may be applied by hand. The value of the book is greatly enhanced by many examples of solution of actual structures. In the second part, more advanced methods are discussed, which are suitable for electronic computers, with which Woolfson has had ample experience. Estimates are made of the future potentialities of the direct methods. Detailed derivations of a number of results are given in the appendices. The book discusses Harker-Kasper inequalities, Sayre's sign relationships, the treatment by Cochran and Zachariasen, the Hauptman and Karle method and Cochran and Douglas multisolution procedure, programmed for EDSAC and modified by Vand and Pepinsky for hand calculation. Multisolution methods require additional criteria to select the right solution, such as the upper and lower bound method of Vand and Pepinsky, the zero-check of Cochran and Douglas, and the Z-test of Woolfson.

Direct methods can now solve (not always) not too complex crystal structures. However, progress is rapid and it is hoped that, thanks to computers,