

To See Farther Standing on the Shoulders of Franks and Lieb, Who Stand on the Shoulders of Meyer and Overton, Who Stand on Bernard's Shoulders, Who Stands...

To the Editor:

We enjoyed the recently published article by Perouansky and its accompanying Editorial^{1,2} and the aphorism opening the editorial "On the Shoulders of the Giants," known also with the acronym of OTSOG. The dazzling suggestion of the aphorism persists also after all these centuries and still allows to draw some lessons and make some reflections. Indeed, sometimes [in science] ... "leaps are often made by knight's-move progress, partly forward but partly sideways"² and the progress can be quite slow.

The OTSOG aphorism is widely known, but it is attributed to different authors around the world: *e.g.*, to Isaac Newton in the United Kingdom and United States and to Bernard of Chartres in Italy and France.³ However, there is no doubt that the famous aphorism was used by others before Newton and Robert Burton who attributed it in "The Anatomy of Melancholy" (1621) to Didacus Stella, erroneously traced back to Lucan's *Pharsalia*. Although the figure of the Dwarf seated on the Shoulders of the Giant was present also in the Greek myth of the blind giant Orion who carried his servant Cedalion on his shoulders, we agree with T.K. Merton that the OTSOG aphorism's should be traced back to Priscian.⁴ Priscianus "Cesariensis," a Latin grammarian born and raised in Caesarea (modern Cherchell, Algeria) in sixth century, wrote the "Institutiones grammaticae," a systematic exposition of Latin grammar that was copied in 526 by Flavius Theodorus, a clerk in the imperial secretariat of Constantinople, and encountered impressive success. Priscian's grammar was the standard textbook for the study of Latin during the Middle Ages and was extensively cited by many authors in several countries. Today remain thousand copies of the textbook, all derived from the Theodorus' copy. In Priscian dedication of the volume to Julian, a Roman patrician, we find the origin of the aphorism: "grammatica ars,.... cuius auctores, quanto sunt iuniores, tanto perspicaciores,...." (grammar's authors, ... the younger, the more perceptive.....). After many centuries, John of Salisbury attributed the Giants' aphorism to Bernard of Chartres in his manuscript "Metalogicon" (1159): "Dicebat Bernardus Carnotensis nos esse quasi nanos humeris insidentes, ut possimus plura eis et remotiora videre, non utique proprii visus acumine, aut eminentia corporis, sed quia in altum subvehimur et extollimur magnitudine gigantea" (according to Bernard, men are like dwarfs who standing on the shoulders of the giants can grow in art and culture). In the following centuries, the image of dwarfs on the shoulders of the giants

was well known, as shown in the Cathedral of Chartres and in the Church of Payerne.⁵ The stained glass of the south transept of the 13th century Chartres Cathedral shows the four major prophets of the Hebrew Bible (Isaiah, Jeremiah, Ezekiel, and Daniel) as gigantic figures, and the four New Testament evangelists (Matthew, Mark, Luke, and John) as ordinary-size people sitting on their shoulders. The evangelists, although smaller, "see more" than the huge prophets (because they saw the Messiah about whom the prophets spoke). Moreover, apostles on the shoulders of the prophets can be found in the Merseburg Baptismal font, in the Prince Portal at the Bamberg Cathedral and in church of Payerne in Vaud Canton in Switzerland, all built before Cathedral of Chartres. In 13th century, the life of the aphorism continued, but its use flourished after it was used by Isaac Newton in a letter sent to his rival Robert Hooke in 1676. In the 18th century, the aphorism was used by Samuel Taylor Coleridge in an issue of his bulletin, *The Friend* (1828): *A dwarf sees farther when he has the giant's shoulders to mount on*. In 1890, the aphorism was again cited, in the second paragraph of Friedrich August Kekulé's staminal lecture for the history of Biological Chemistry at Benzolfest. The OTSOG aphorism has been largely used by writers such as Umberto Eco, by physicists, including Stephen Hawking, by politicians such as Disraeli, Buckarin, and United States presidents (*e.g.*, Thomas Jefferson, Ronald Reagan, and George Bush later).⁵

We agree with Kuhn that research forces nature into old paradigm until "normal" science can no more evade or explain these anomalous observations. We are convinced that the readers of *ANESTHESIOLOGY* who have been interested, moved, and fascinated by the quest for a unified model of anesthesia through so impervious pathways could appreciate this footnote of the history of science.

So, please to see farther let's stand on the shoulders of Franks and Lieb, who stand on the shoulders of Meyer and Overton, who stand on Bernard's shoulders, who stands...

Piersandro Sette, M.D.,* Romolo M Dorizzi, M.D., Anna M Azzini, M.D. *G. Fracastoro Hospital, San Bonifacio (Vr), Italy. piersandro.sette@gmail.com

References

1. Perouansky M: The quest for a unified model of anesthetic action: A century in Claude Bernard's shadow. *ANESTHESIOLOGY* 2012; 117:465-74
2. Ginosar Y, Binshtok AM: Mechanisms in anesthesia and analgesia: Convention, crisis, and the shoulders of giants. *ANESTHESIOLOGY* 2012; 117:451-3
3. Harden RM: Looking back to the future: A message for a new generation of medical educators. *Med Educ* 2011; 45:777-84
4. Merton RK: On the shoulders of the giants: A shandean postscript. The Post-Italianate Edition. Chicago: The University of Chicago Press, 1993
5. Dorizzi RM, Sette P: Standing on the shoulders of giants—Isaac Newton? Bernard of Chartres? Priscian! *Pharos Alpha Omega Alpha Honor Med Soc* 2012; 75:1p following 60

(Accepted for publication December 18, 2012.)