Letters

The Littlest Astronomer (continued)

On another mountain lived three other astronomers. The biggest astronomer was very smart; he knew more than just about anybody about telescopes and the stars. He had built the Great Telescope on the mountain and it was famous all over the world. He liked to build telescopes, but best of all he liked to explore the sky with them and see a thing a little better than it had ever been seen before. He couldn't do this much any more. He knew that there were not enough telescopes for all the good astronomers, and that we would learn more about the sky, in the long run, if he spent his time getting more telescopes instead of just using the Great Telescope. Getting more telescopes was hard work, and he had to spend much time far away, where the keepers of the money lived.

The middle-sized astronomer was also smart. He was an expert on making telescopes work, and on making special calculations, and particularly on what was an important thing to work on. He liked best to explore the sky with the Great Telescope, and to understand something a little better than it had ever been understood before. He couldn't do this much any more. All day the littler astronomers came to his office and asked him to give advice about their projects, to fix their mistakes, and to adjust the telescope a little better for them so they would do better the next night. He always helped them, and all the astronomers discovered more as a result. The astronomer was glad. When the biggest astronomer was gone, as he often was, the middle-sized astronomer had to do all the biggest astronomer's work, too. Sometimes he had to say something about astronomy on television. He didn't like this, because it was embarrassing, but he knew that if he didn't say it the television people might have a bad astronomer say things that were wrong, and then all the astronomers would be embarrassed and unhappy. It was hard work, but there was no one else who could do it.

The littlest astronomer was smart, but he had never tried to be an expert at anything. Nobody came to him for advice, because he didn't know any more than anyone else. He was glad no one bothered him. Best of all he liked to explore the sky with the Great Telescope, and that's all he did. He published lots of papers.

One afternoon the keeper of the Great Telescope came to the three astronomers and said, "The middle-sized astronomer has adjusted the telescope carefully and it will be a beautiful night tonight. Who would like to use the telescope?"

"I can't," said the biggest astronomer. "I was up all last night coming from the city where the keepers of the money live, and I am very tired. It was very uncomfortable, because I bought the cheapest ticket to save money. This evening I must find a way to build another Great Telescope that is better than ours, but which costs a little less. Our Board of Trustees needs the answer day-after-tomorrow. It will be hard, but I think I can do it. And I would like to play with my little boy just a little—I have not seen my family for a week."

"I can't," said the middle-sized astronomer. "This evening I must go to a college where there are no astronomers and tell the science students how exciting astronomy is." He had asked the littlest astronomer if he could give the lecture, but the littlest astronomer had said he had too many observations to study, and besides, he gave so few lectures that he wasn't very good at it.

"I can," said the littlest astronomer. And he did.

Later that night, as the littlest astronomer finally went to bed, the biggest astronomer was still awake, looking at the dark ceiling of his bedroom and worrying.

"Have I found the best and cheapest way to build a Greater Telescope? Will it best explore the most important problems I know of?" He tossed and turned, knowing he must be right so that all the astronomers could learn more about the sky.

The middle-sized astronomer was still awake, too. He had driven through a bad snowstorm until very late, because the students had kept him so long asking questions. Some had decided they wanted to be astronomers, too, and he was glad. But tomorrow he would have to make a very careful calibration of the Great Telescope so that the littlest astronomer could analyze his observations. He tossed and turned, trying to decide the best way to make the calibration. It had to be right if all the astronomers were to get the right answers. No one but the little astronomers would ever know who had arranged for them to get these right answers.

The littlest astronomer was sound asleep, and very happy. No one had bothered him all day. He could use the Great Telescope almost any time he wanted. He did just as he pleased, all day, every day. It was a good life.

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History of Carbon-14

I wish to record my wholehearted agreement with both the facts and the sentiments contained in Pollard's letter [*Science* **140**, 1268 (1963)] about the history of C^{14}. It is most regrettable that his very remarkable contribution to this subject was not mentioned in my article [*Science* **140**, 584 (1963)]. I am most grateful to him for his action in making possible a more complete record and, in addition, for emphasizing the main point of my article, which was that the discovery of C^{14} in the *physical* sense had been made by 1936 (and confirmed as late as 1939) but that its discovery in the *chemical* sense still remained in 1939 in the category of unpredictable events.

Pollard's report, published at the end of 1939, came to my attention shortly after Ruben and I had completed our identification of the C^{14} produced by the $C^{13}(d,p)C^{14}$ reaction in February of 1940. It presented evidence for the existence of the protons expected from this reaction, and thus extended and further verified the conclusions reached by Burcham and Goldhaber, and by Bonner and Brubaker, in 1936 to the