

## In Memoriam — Leon Bankoff

We were saddened to learn of the recent death of Dr. Leon Bankoff, who has been a contributor to *CRUX* over many years. Sadly, he was not able to contribute recently, and some of our more recent readers may not know so much about him. We refer you to an excellent article in the March 1992 issue of the *College Mathematics Journal*, entitled *A Conversation with Leon Bankoff*, written by G.L. Alexanderson.

One of Leon's long time friends, Dr. Clayton Dodge, has written the appreciation printed below.

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Leon Bankoff practiced dentistry for sixty years in Beverly Hills, California, until his retirement just a few years ago. His patients included many Hollywood personalities whose names are household words. Among his several other interests, such as piano, guitar, calculators, and computers, he lectured and wrote papers both on dentistry and mathematics. His specialty was geometry, and the figure he loved best was the arbelos, or shoemaker's knife, which consists of three semicircles having a common diameter line. The two smaller semicircles are externally tangent to each other and internally tangent to the largest semicircle.

It is said that the test of a mathematician is not what he himself has discovered, but what he inspired others to do. Leon discovered a third circle congruent to the twin circles of Archimedes and published that result in the September 1974 issue of *Mathematics Magazine* ("Are the Twin Circles of Archimedes Really Twins?", pp. 214-218.) This revelation motivated the discovery by Leon and by others of several other members of that family of circles. An article on those circles is in progress.

Dr. Bankoff edited the Problem Department of the *Pi Mu Epsilon Journal* from 1968 to 1981, setting and maintaining a high standard of excellence in the more than 300 problems he included in its pages. Although the *Journal* has a relatively small circulation, its Problem Department grew to have a large number of regular contributors. He became acquainted with *Crux Mathematicorum* early in its history, when it was called *Eureka*, and made many contributions to its pages over the years, maintaining a close friendship with its founder and first editor Leo Sauvé. Like Leo, who started *Crux* to add some spice to his mathematical life of teaching basic post high school courses, Leon worked in mathematics for mental exercise and recreation, making friends with and earning the respect of many well known mathematicians.

Leon and I became good friends, first through correspondence regarding the *Pi Mu Epsilon Journal* Problem Department, and later through many personal meetings, including the August 1979 meeting of problemists in Ottawa, sponsored by Leo Sauvé and Fred Maskell of *Crux*. Following the

formal sessions in Ottawa, seven of us drove to Quebec City for an enjoyable weekend of sightseeing and fellowship: Leo and Carmen Sauvé, Leon and Francine Bankoff, Charles and Avetta Trigg, and I. Since his retirement from his dentistry, Leon has worked on the manuscript for a proposed book on the properties of the arbelos, carrying on a monumental task started by him and the late Victor Thébault. Much material has been collected for this project and much remains to be done on it. Indeed, he asked me to finish the job.

At one time some years ago a schoolgirl wrote to Albert Einstein about a mathematical question she had. Apparently Einstein misinterpreted her question and gave an incorrect answer. Bankoff pointed out this error and in his mathematical museum he now has a copy of the Los Angeles Times with the front page headline “Local Dentist Proves Einstein Wrong.”

Leon developed many physical problems in his later years. He was a fighter and he won several physical battles. When I last visited him at his home in Los Angeles in October 1996, he was fighting liver cancer, but still working on the Thébault material, in spite of failing eyesight. On Sunday afternoon, February 16, 1997, the cancer overtook him and he died at his home at the age of 88.

He was a gentleman, a scholar, and a true friend.

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## Heronian Triangles with Associated Inradii in Arithmetic Progression

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*In memory of Dr. Leon Bankoff*

1. The area of a triangle is given in terms of its sides  $a, b, c$  by the Heron formula

$$\Delta = \sqrt{s(s-a)(s-b)(s-c)},$$

where  $s := \frac{1}{2}(a+b+c)$  is the semiperimeter. A triangle  $(a, b, c; \Delta)$  is called Heronian if its sides and area are all integers. L. Bankoff [1] has made an interesting observation about the Heronian triangle  $(13, 14, 15; 84)$ . The