

This article is unclassified.

## THE LEGACY OF LAMBROS DEMETRIOS CALLIMAHOS

(b) (3) - P.L. 86-36

The Agency is very fortunate to have the legacy of Lambros Demetrios Callimahos: the course which he spent the last 22 years of his life developing and teaching. The extraordinary Callimahos course is a beautifully engineered collection of problems, writings, and ideas designed to give Agency cryptanalysts technical knowledge, breadth of experience, and a sound professional approach. Mr. Callimahos created a course which presents an overwhelming variety and volume of material to the students and at the same time fosters class and individual contribution to an unusual extent. The well-organized subject matter, colorful presentations, and the promotion of a healthy combination of competition and cooperation among his students all contribute to the Guru's remarkable success as a teacher.

He was completely at home with the subject matter of the course, and he had an uncanny knack for composing problems which gave just enough information to permit solution — and he was frequently able to inject some humor into the problems to keep them interesting. It was, however, his talent for inspiring teamwork among his students that I found most impressive.

Students would arrive at the classroom on the first day of class as twelve individuals from different organizations. They would be greeted by twelve well-stocked desks, each with a student's nameplate, and as soon as the students sat down, they became six teams of two — just by virtue of the arrangement of the desks in the room. For the next eighteen weeks each student had a responsibility to his partner, to the class, and to the course. The student who best met all these responsibilities would get the most from the course.

Students' responsibilities to each other included being prepared to help clarify any unclear points which might arise. This is clearly a two-way street. Let us take a hypothetical situation: suppose Yuri and Svetlana are seated at adjacent desks (how did they get in the class?). And suppose also that the class is studying transposed optics (a feature of enciphered facsimile, a portion of the course which has not yet been fully — or even partly — developed). The whole concept is unclear to Svetlana, but not so to Yuri, who explains the matter to her. She catches on but doesn't understand why the shady light diagonals can be formed into chains. Yuri had never thought of this point, so he tries to figure it out. Before he does, though, Svetlana has tumbled to the answer and explains it to him. By the time both are satisfied that they know what's going on, they have both either learned something or reinforced what they had already known.

Armed with this knowledge, Yuri and Svetlana attack the first problem and solve it quickly. Then they discover that they are the only ones who have the picture, so they check with their classmates to see what the hang-up is. The rest of the class is stalled because they, too, don't understand the implications of the shady light diagonals. So Yuri and Svetlana go to the blackboard, and with a few deft sweeps of the chalk, they explain the solution to the class.

If this had been the first class to work on these problems, the Guru would have asked them to write up their solutions to each problem. The class would then have become a committee of the whole and, having appointed a scribe, would have created a report which describes the whole solution process. In this report they might have emphasized the impor-

tance of understanding the implications of the shady light diagonals and suggested that the amount of time required to solve the problem could be cut in half if students were given more data with which to work.

As this example illustrates, the course grew through class contributions. Problems were discarded because they failed to demonstrate enough new points, or because they were inordinately difficult, or for some other reason. New problems might be created to demonstrate a different technique or to show other forms of the problem. Such changes in the course were often the result of student comment or reaction.

The class was also a natural environment for one to develop the qualities of leadership. Typically, the backgrounds of students varied considerably. As a class started a new problem area, whoever had experience in that area became a consultant to the rest of the class and might lead the class through that set of problems.

Many graduates of the Callimahos course were fascinated by the wit and cultural ebullitions of the exalted Guru. This was such an integral part of the course that members of classes 17 through 20 compiled a list of 100 questions, culled from the parenthetical musings of the Guru, which any attentive student should have been able to answer by graduation day. Entitled "Dundee Society Introductory Placement Test," the list includes questions covering a wide range of subjects: mathematics, physics, history, gastronomy, music, philosophy, medicine, English, etymology, geography, language, chess, communications, cinematology, literature, and biology. Questions ranged from "What are the first 10 digits of pi after the decimal point?" to "The Anarchist Congress held

in Brussels in 1914 was conducted entirely in what language?" From "Give the date when combination snuff boxes and slide rules first appeared in England?" to "What is the plural of Sphinx?" Legend has it that anyone who could pass this test needn't take the course.

Such facets of the Callimahos personality as the observations and parenthetical remarks that prompted these questions, gave the course a character of its own. Here was a teacher who gave instruction in snuff-taking and, on occasion, played the flute. Some classes were lucky enough to have had a flute concert to work by (at least my class did), while Callimahos, flute virtuoso, practiced for one of his rare public performances. These were some of the extras — a perfect garnish to the meat of the course.

Much of the course is still with us in the form of mimeographs and textbooks, technical problems and papers, and recordings of lectures and even flute recitals. So students can still learn about general cryptanalysis the Callimahos way. Of such is the legacy of Lambros Demetrios Callimahos.

[redacted] came to NSA in 1957 after receiving his B.A. and M.A. from Florida State University. Trained as an analyst and a linguist, he has had a variety of assignments in operations and two tours overseas. Since 1976 he has taught CA-400 and served as Guru-Ji of the Dundee Society.

NR