

Introducing - -

COLBY'S TOP-FLIGHT MATHEMATICIAN

THE scene is at the front entrance of Memorial Hall. A knot of students are seated on the steps in the sun, all heads bent in concentration upon something, while an excited hum of questions and arguments arises. "What goes on?" you wonder, and your mind suggests various collegiate matters which might be at the bottom of such interest. Approaching and peering over the heads, you see a pencil rapidly jotting down mathematical symbols and pointing to a diagram, while a resonant voice, enriched by a trace of accent, carries on an explanation.

The speaker is a man in his late thirties, whose dark hair, ruddy high cheekbones and flashing grin give his maturity a boyish expression. As you eavesdrop, you discover that the subject under debate is a mathematical puzzle, one of those ingenious brain-teasers. The students, you gather, had trailed their instructor out of the classroom, down the stairs, and across the campus without a break in the conversation. Now, they were excitedly getting down to the principles behind the puzzle. Apparently, nothing less than extreme measures could bring that particular class to an end on that day.

That is the way that Assistant Professor Isaac J. Schoenberg is teaching mathematics at Colby.

Dr. Schoenberg (his friends call him "Iso") combines in a rare way the two opposite qualities which make up the ideal college professor: he is a top-flight creative thinker in his field and he is a teacher, in the fullest sense of the word.

To the lay person, there is something awesome about a mind that is able to roam about in the ethereal realms of higher mathematics. Perusing one of Schoenberg's many published papers, you have a baffled sensation

This is the first of a series of sketches by which we aim to introduce some of the younger members of the Colby faculty to our readers, and show that our tradition of great teaching is by no means confined to the past.

that while the words are good English words, yet he must be talking another language. But his papers must make sense, for there is a mailing list of people and institutions all over the world who want every one of his publications. He speaks regularly before the American Mathematical Society and other professional bodies, frequently being selected for one of the general sessions — proof of the recognition accorded him by his mathematical peers. His explorations and findings are the basis of work being carried on by several other mathematicians; particularly by Bochner of Princeton.

Schoenberg's particular field, if you must know, is "positive definite functions, with applications to the isometric imbedding of metric spaces in each other." To understand that, you have to take a good many courses of college math, but if you

want some slight elucidation, we will make a stab at it. If you don't, skip the next paragraph.

To start with, we all know the three dimensions of space, and have heard about a mysterious "fourth dimension." Well, mathematicians didn't stop there; they went on and found out that if they "make believe" that there are any number of different dimensions, it helps them to explain a good many practical things, particularly in physics (Quantum mechanics). All that is in the realm of geometry. The study of calculus or "functions," (remember in your sophomore year?) has been similarly developed to dizzy heights, and this in its more complicated forms is known as "analysis." Now, it seems that the Viennese mathematician Menger (now at Notre Dame) has figured out what would happen if one abstract space were placed ("imbedded") in another abstract space, reasoning from the purely geometric point of view. What Schoenberg is doing is also investigating this imbedding of abstract spaces, but approaching it (and successfully) with the technique of analysis (calculus). Does that give you any inkling as to what it is all about? No? Well, then, suppose you try to express in 150 words the end-product of years of concentrated study and brilliant speculation! And now, let's get back to Colby.

Obviously, however gratifying it may be to have significant contributions to human knowledge coming out of Colby, it could be that such a scholar was a complete flop as a teacher for undergraduates. Not so with Schoenberg! His mind can return from the dizzy heights and deal with the simple bewilderment of a freshman without impatience and without losing stride. Strangely enough, it is the elementary classes which he particularly enjoys teaching.



Assistant Professor Isaac J. Schoenberg

He says that it keeps him conscious of fundamentals and he enjoys the challenge of making students see the fascination of his subject.

Something of Schoenberg's approach is seen in a new course called "Non - Technical Mathematics" which he introduced last year. Aimed for students who do not plan to take any further work in math, he is freed from the necessity of drilling them on fundamentals preparatory for advanced work, and so can teach the subject solely for its cultural and mind-stretching values. Students say that it is a hard course, but fun.

There is no text book for such a course (he could write a good one, if not occupied with more important work) and the secret lies in the fact that he has gone back to Seventeenth and Eighteenth Century mathematics, a time when it was held to be a delightful intellectual accomplishment. The literature of that period devotes much attention to mathematical puzzles, tricks, analysis of games of chance, and so on. The schoolmasters of the Nineteenth Century, he says, turned the science into a grim and determined grind, an adjunct to the machine-age civilization. German scholarship took it over and the keynote became drill, and more drill. So, being familiar with the literature (chiefly French and Italian) of those earlier Centuries, he has called upon this store of knowledge to enliven the subjects for the students in "Math 1a."

His teaching schedule also includes courses in Advanced Calculus, Geometry, Mechanics, and a seminar course called "Special Topics," which really means that he carries the handful of senior math majors into as advanced work as they are able to comprehend.

His classroom manner is vigorous, energetic, never losing the attention of the class, and using the blackboard constantly and effectively. One notes his vivid and concrete analogies, his ability to crystallize abstract concepts. English is, of course, an acquired language, and yet he has an extraordinary gift for precision of phrase, and he talks with wit and grace. It is more than linguistic ability, it reveals clarity of mind and a quality of personal distinction.

In person, Schoenberg exudes vitality. He enjoys hard exercise, likes

to ride, ski, climb mountains, do strenuous outdoor work. On the other hand, he plays the violin with almost professional skill—although never in public, not having the time to practice to the extent he deems necessary—and is highly literate musically. His sister, incidentally, is Irma Schoenberg Wolpe, now of New York, a concert pianist (her recital here last winter was notable) and wife of Stefan Wolpe, composer.

Schoenberg doesn't know when or why he began to specialize in mathematics. He remembers that he had a liking for figures even as a small boy in Roumania. He was born in Galatz, a Danube port, and his family moved to Jassy when he was ten. He naturally matriculated at the University of Jassy, receiving his A.M. degree at the age of 19, and then spending three years of study at the Universities of Berlin and Goettingen, returning to Jassy for a year's work and a Ph.D. degree in 1926.

There followed a year of compulsory military service as an artillery officer in the Roumanian army, and then positions on the faculties of Jassy, Goettingen, and a summer session at University of Jerusalem. This last was a most eventful experience for two reasons: he had to lecture in Hebrew, and here he met the charming daughter of his revered Goettingen professor, Edmund Landau. Back in Goettingen, his visits to the master's household became more and more frequent and in 1930 Dolli Landau became his bride.

Then came the turning point in his career: the day in 1930 when he received word that he had been awarded an International Research Fellowship from the Rockefeller Foundation to enable him to devote himself to his thinking on the calculus of variations. The authority in this field was

Prof. G. A. Bliss of University of Chicago, so the Schoenbergs set out for America, little knowing that the blight of Nazism was about to creep over the high traditions of the German universities.

A year in Chicago in study, another as instructor, another on the Harvard faculty (where he came to know Marston Morse, '14), a year and a half as a Fellow at Princeton's Institute for Advanced Studies, the balance of that academic year as acting assistant professor at Swarthmore, and then, in the fall of 1936, Colby College—those are the bare facts, although the real story of those years is the gradual acceptance of Schoenberg by American mathematicians as one of the few young men whose progressive research is important and worth listening to.

The Schoenbergs like Waterville and Waterville likes them. Their home is the scene of informal gatherings where there is apt to be a hum of good talk, and refreshments with an Old World flavor. Under some sort of cooperative arrangement, half a dozen of the faculty's "young intellectuals" have been dining with the Schoenbergs nightly for a couple of years—a highly successful procedure, they report, both from the culinary and conversational standpoints. The apartment has many European heirlooms—furniture, rugs, pictures, silver—and reflects the taste and cultural background of the hostess.

Dolli Schoenberg is little and gay, with an infectious laugh. The family consists of two little girls, 9 and 3. Mrs. Schoenberg's mother (who, by the way, is the daughter of the famed Dr. Ehrlich) came to America following the death of Prof. Landau, arriving from Germany, with what possessions she was allowed to bring, a mere matter of days before Hitler marched and travel ceased. Prof. Landau's magnificent collection of mathematical treatises was bequeathed to Prof. Schoenberg, and is now installed in the Colby library.

Schoenberg doesn't talk much about international affairs. The events cut deep, but he only says of his native Roumania: "It isn't a happy place to live in, now." He appreciates America. A few days ago, he received his final papers and took his oath as an American citizen.

