EDUCATION

Study Russian Education

The emphasis in the U.S.S.R.'s program for educating prospective engineers is on preparing the student for a particular specialty, with little provision for changing a study course.

➤ WHEN A Russian boy or girl looks to engineering for a career, he or she must choose one of 160 narrow specialties—and stick with it. Such a specialty might be "mechanical engineer, automobile designer," or "mechanical engineer, automobile maintenance."

In contrast, an American boy or girl has a choice of about 20 broad fields, with five fields attracting the majority of students. An American student can switch curriculums as he sees fit, but the Russian student stays unless the Government decides to make the change.

These were a few observations reported by an eight-man mission of American engineering educators who returned recently from a three-week tour of 25 U.S.S.R. schools and research institutions. The mission was sponsored by the American Society for Engineering Education and the National Science Foundation. A Soviet mission to the United States is planned for February, 1959.

The Russian engineering education plan is geared, and adjusted yearly, to reflect accomplishments in expansion of industry, need for replacements, and replacement of inadequately trained personnel. It predicts that 350,000 will graduate in all professional fields (engineering, science, medicine, languages, etc.) each year. This is an increase of 40% over past seven-year average. But in engineering, the increase will amount to 90%.

The plan specifies the number who may enter schools, how many may train for each field, the quota for each specialty at each school and the jobs available upon graduation. Because of this, competition among students is high for admission, and is spread fairly evenly across-the-board.

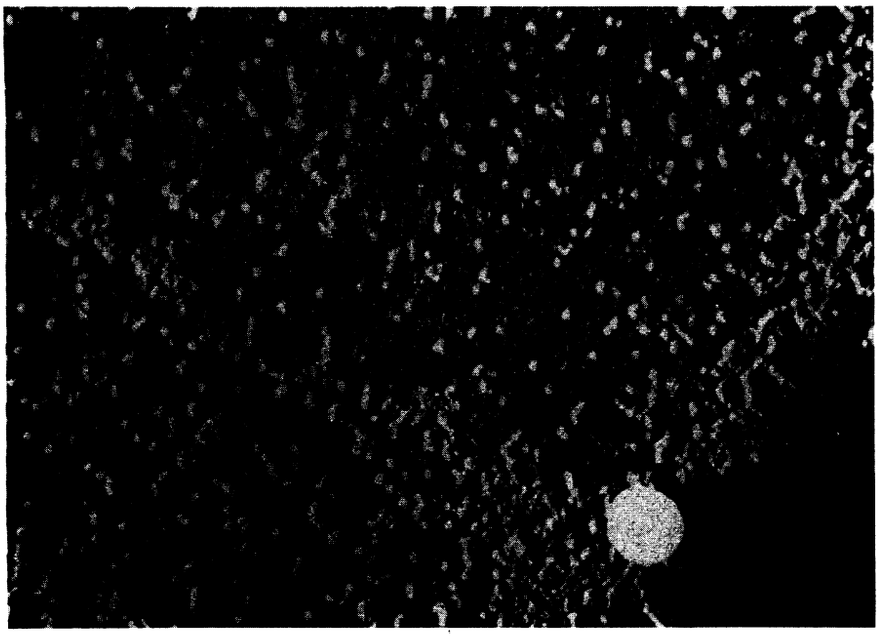
About 90% of those entering day school manage to complete the five to five and one-half year courses. Of these, about one-third are women.

The U. S. mission reported that students approach their studies seriously, and there is little room or student approval for foolishness. Poor scholars are sometimes hazed by their classmates in an effort to make them get down to real work.

"The young Soviet engineers," the mission reported, "are well-grounded, and their best men are as good as any in the world. However, it appears to the delegation that many must be limited in their outlook by knowing little engineering outside their own narrow field."

The mission was composed of Dr. F. C. Lindvall, California Institute of Technology; Prof. N. A. Hall, Yale University; Dean W. T. Alexander, Northeastern University, Boston; Dr. W. L. Everitt, University of Illinois; Prof. R. E. Fadum, North Carolina State College; Dr. A. G. Guy, Purdue University; Dr. R. A. Morgan, Purdue Research Foundation; and Dr. Leon Trilling, Massachusetts Institute of Technology.

Science News Letter, December 20, 1958



PROTEIN-MAKING PARTICLES—Magnified thousands of times, this is how the protein-manufacturing cellular particles appear as viewed through the electron microscope. The microscopic plastic ball, seen at lower right, is included for size comparison; it is less than one half micron in diameter. (There are approximately 25,400 microns in one inch.)

● RADIO

Saturday, Dec. 27, 1958, 1:35-1:50 p.m. EST

"Adventures in Science" with Watson Davis, director of Science Service, over CBS Radio network. Check your local CBS station.

Mr. Davis will forecast science advances for 1959.

BIOCHEMISTRY

Proteins Produced In Test Tube

➤ THE PROTEIN-manufacturing system of the living cell can work in a test tube, an Ohio State University biochemist has reported.

Now that they are able to study protein manufacture outside the cell, scientists may learn how specific kinds of proteins are made, Dr. George C. Webster said. This may aid research in cancer and tumors, as well as virus studies.

The system works in the following way:

Muscle, yeast, liver, plant and bacteria cells are first "disrupted" by a gentle grinding action; then cell components are separated by applying various centrifugal forces. Thus, Dr. Webster explained, the manufacturing system consisting of cellular particles composed of protein and nucleic acid is removed.

The system is then placed in a test tube to which has been added amino acids (protein "building blocks") and adenosine triphosphate, or ATP. Two co-factors, guanosine triphosphate and a small polynucleotide, are added to help the reaction along.

Proteins are best produced at a maximum of 98.6 degrees Fahrenheit which is normal body temperature, Dr. Webster said. In fact, heat appears to be a controlling factor in the process.

While an isolated protein manufacturing unit is not alive in the sense that it can grow or produce cells, it can carry out some of the activities in a test tube that it would in a cell, the biochemist pointed out.

"The cellular particles serve rather as machines which convert the amino acids into proteins," he said.

The manufacturing systems can be frozen and stored for long periods of time without losing the ability to carry out this conversion which takes about 20 minutes.

Details of the new technique will appear in a paper Dr. Webster is preparing for publication in the *Journal of Biological Chemistry*.

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