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This is the third issue of the Bulletin devoted to presenting the curricular activities of the College. In the December issue the seminar was described and in March the Language Tutorial. The current number is devoted to the Mathematics Tutorial. Succeeding articles will deal with the laboratories, the formal lectures, and the choral exercises. These activities, taken together, represent a single, unified course of study in the liberal arts, organized around the literary and scientific tradition of Western Civilization as contained in a representative list of great or important books. These Bulletins will seek to present not only the ideal toward which the College aspires in this program, but also certain problems and difficulties which arise in the actual operation of the program.

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THE MATHEMATICS TUTORIAL

In the preceding issue of the Bulletin we discussed the Language Tutorial as one of the devices designed to supplement the free discussion of the seminar by confronting the student with the problems and methods of a careful study of languages and all that this implies. But there is another kind of language used by man, no less intricate in its structure and perhaps more necessary for the understanding and mastery of nature. That is mathematics. Insofar as things can be counted and measured, they are objects of mathematical science; their number and size and shape, the frequency of their occurrence, the rate of their motion, the figure of their orbit or trajectory, their weight and density, and the work they do can be stated in mathematical symbols. This language of numbers and magnitudes, of ratios and proportions, is studied in the mathematics tutorials in its historical development and in both its pure and applied forms.

The external setup of the Mathematics Tutorial is identical with that of the Language Tutorial. Each student has a mathematics tutorial daily throughout his four years at St. John's. The class numbers from eight to fifteen students and meets around a large table under the guidance and instruction of one of the tutors.

ITS' CONTENT

The students begin with plane and solid geometry, the elements of Euclid and the conic sections of Apollonius. They are thus con-

fronted with rigorous, logical systems; they apprehend the idea of a deductive science and acquaint themselves with the intricacies of mathematical development.

In the second year they study Ptolemy and pass immediately to Copernicus: they face in these studies two grandiose examples of a mathematical description of the universe; they learn the role and power of a scientific hypothesis and the meaning of applied mathematics. These astronomical investigations also introduce them to the elements of trigonometry. For the rest of the Sophomore year the students apply themselves to algebra and analytical geometry, with due regard to the original Cartesian foundations. Not only do the students learn how to manipulate algebraic expressions, perform all the necessary operations, including logarithmical ones, solve equations and correlate these analytical solutions with the exploration of geometrical patterns, but they are also made to grasp the very idea of a Universal Mathematics as conceived by the great thinkers of the seventeenth century.

In the beginning of the third year the students expand their skills in analytical geometry and tackle the elements of mechanics as laid down by Galileo. Concurrently, the students acquaint themselves with the principles of Keplerian astronomy. Most of the third year, however, is devoted to Newtonian physics: large parts of Newton's *Principia* are studied and discussed very carefully. The first elements of calculus are approached.

In the fourth year, differential and integral calculus (including elementary differential equations) is studied almost exclusively, in its rigorous modern form. The students are finally introduced into non-Euclidean geometry (Lobachevski), the theory of numbers (Dedekind), and the theory of transfinite numbers (Cantor).

Throughout the four years the students are in continuous contact not only with the pure science of mathematics but also with the very foundations of mathematical physics, the great weapon of man in his struggle with Nature. Throughout the four years the Mathematics Tutorial supports therefore the seminar discussions bearing on the relation of man to nature, the criteria of intelligibility, the nature of knowledge, and the all-powerful role of symbols.

LOGICAL RIGOR AND IMAGINATION

The work done in the mathematics tutorials imposes upon the students the duty of rigorous demonstration; the blackboard becomes the arena of intensive logical struggles. The students are made to see how the discovery of logical inconsistencies leads to a revision of the assumptions upon which mathematics builds. But it is not only logical rigor that is expected from the students; their imagination is constantly brought into play. Any device that might help their imaginative effort —geometrical models, mechanical linkages, astrolabes, etc.—are used and often the students themselves are asked to construct them. Whenever the occasion requires it, the students have to apply their skills to the solution of problems. All this detailed preoccupation with mathematical objects and methods, however, is subservient to the more general consideration of the relation that mathematics has to problems raised in the seminar. On the other hand, the mathematics tutorials refer most of the time directly to the work done in the laboratory.

THE CHIEF AIM

The chief aim of the Mathematics Tutorial is to give the student insight into the nature and practice of abstract thinking, of reasoning that proceeds systematically from definitions and principles to necessary conclusions. He sees and becomes familiar with the power of a method or methods that can gather into a single formula or law the most diverse phenomena and can thereby predict and even control their occurrence. His intellectual imagination is freed and developed to the point where he can investigate the structure of worlds that are possible—that is, consistent—beyond the power of sense. It is in the various mathematical sciences that abstract imagination and reason are seen at their most impressive and effective work. Here all is distinct, orderly, and necessary. To see reason thus at work—building its structures as in pure mathematics, or making the world intelligible as in the mathematical sciences of nature—is perhaps the most exciting and absorbing of all intellectual activities.

COLLEGE NEWS

A St. John's College Open House, held April 17, afforded a large group of Maryland educators a firsthand acquaintance with the College and its new president. County superintendents, high school supervisors, principals and headmasters spent the entire day visiting tutorials, laboratory classes and seminars.

They also toured the campus, lunched and dined with the undergraduates, and heard an address by Dr. Luther H. Evans, Librarian of Congress and a member from the United States on the UNESCO Executive Board in Paris, on "UNESCO and World Educational Goals."

A new four-year tuition scholarship at St. John's College has been set up in the name of George Washington Parke Custis, step-grandson of George Washington and a St. John's graduate in 1799. It will be awarded to a high school graduate from the State of Virginia or the District of Columbia on the basis of his competence to pursue the St. John's Program and his performance in writing a 2,000-word essay on "The Meaning of Education." Authors of the four best essays will be invited to the college for personal interview.

Members of the Examining Committe to select the winning essays are Dr. Dowell J. Howard, Acting Superintendent of Public Instruction, Richmond, Va.; Walter S. Robertson of Richmond, Va.; Francis Pickens Miller of Charlottesville, Va., Vice-Chairman of the Board of Visitors and Governors of St. John's; Charles Nelson, Director of Basic Education Program, University College, University of Chicago; and Richard Scofield, St. John's tutor and a member of the Board.

Contemporary problems in the United States and the world are brought into sharper focus for the St. John's College community through the current events talks of its Sunday Evening Meeting series. This month's schedule of informal addresses began with one on "American Foreign Policy in the World Today," by Dr. Samuel Flagg Bemis, Farnam Professor in Diplomatic History at Yale. Speaker for April 16 was Edwin M. Wright, adviser on UN affairs in the Bureau of Near Eastern, African and South Asian Affairs of the State Department, on "Trouble Spots in the Middle East."

Others are: April 23—Leonard J. Cromie, Officer-in-Charge of Greek Affairs in the State Department, on "The Role of Greece in American Foreign Policy"; and April 30—Ernest von Hartz, St. John's 1926, National News Editor of the *New York Times*, on "The Fourth Estate."

Programs in the St. John's Radio Seminar series, "Background of Democracy" are as follows:

April 9	Machiavelli:	*The Prince.* Guest: Thurman Arnold, former prosecutor with the U. S. Department of Justice.
April 16	Calvin:	Institutes, Book IV, chapter 20 *"Of Civil Government."* Guest: Rev. A. T. Mollegen of the Episcopal Theological Seminary at Alexandria, Va.
April 23	Locke:	*Second Essay on Civil Government.* Guest: Frank Pace, Jr., Secretary of the Army.
April 30	Rousseau:	*Social Contract I.* Guest: Gov. William Preston Lane, Jr., of Maryland (tentative).
May 7	Rousseau:	*Social Contract II.* Guest: Rep. Edward T. Miller, Republican Congressman from Maryland.
May 14	John Stuart Mill:	*On Liberty.* Guest: Sen. Paul H. Douglas of Illinois.

Broadcasts are heard each Sunday at 6:30 p.m. over the following Continental FM Network stations: WMAR-FM in Baltimore, 97.9 mc.; WASH-FM in Washington, D. C., 97.1 mc.; WMFM-FM in North Adams, Mass., 97.5 mc.; WQAN-FM in Scranton, Pa., 92.3 mc.; WACE-FM in Chicopee, Mass., 100.3 mc.; WBIB-FM in New Haven, Conn., 100.7 mc.; KE2XCC-FM in Alpine, N. Y., 93.1 mc.; and WBCA-FM in Schenectady, N. Y., 101.1 mc.

Friends of St. John's College are entitled to a ten percent reduction on the list price of books ordered from the college book store. Book lists are available upon request.


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