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# THE NEWS

CITY COLLEGE OF NEW YORK

VOL. XXI — NO. 8

WEDNESDAY, JANUARY 6, 1965

STUDENT FEES

## Physics Department Revises Curriculum

City College's department of physics has revised its undergraduate curriculum to reflect recent changes in physics and physics teaching, it was announced by Dr. Buell G. Gallagher, president of the college.

The curriculum change comes after a two-year study by a curriculum committee of the department. Instituted this semester, the reorganization provides for the introduction of new material including radiation, quantum mechanics, and relativity, and the consolidation of established curricula.

The department has introduced "core," a sequence of courses which must be taken by all physics majors planning to pursue graduate studies.

While the new curriculum incorporates aspects of twentieth century physics, such as relativity and quantum mechanics, classical physics has not been neglected, according to Professor Fred C. Rose, a member of the curriculum committee and an undergraduate advisor.

Some one-semester courses have been expanded into one-year courses in order to incorporate more material and "to facilitate the teaching of related concepts," Dr. Rose said. The expanded courses include Radiation and Physical Optics, enlarged from Physical Optics, and Modern Physics I and II, courses which draw, in part, upon previous individual courses eliminated from the curriculum.

Among the new courses is Physics of the Upper Atmosphere. It deals with physical states and phenomena of space beyond the

troposphere. Much of the course material has been obtained recently from rocket and satellite explorations, according to Professor Harold L. Stolov who teaches the course.

The "core" aspect of the new curriculum revision was instituted in order to give continuity to different and widely separate courses, as well as to insure the adequate preparation of physics majors for research work and graduate school.

Laboratory work has been made an integral part of the course in so far as present space permits. Students who major in physics, but do not plan to attend graduate school, need not follow the "core" after the sophomore year. They elect further courses in consultation with departmental advisors.

The "core" includes General Physics, Mechanics, Electricity and Magnetism, Thermodynamics, Radiation and Physical Optics. Modern Physics, and Modern Physics Laboratory. In addition, majors may choose up to seven "free" electives, including Acoustics, Electronics, Statistical Mechanics and Solid State.

Course requirements in fields related to physics have also been strengthened for physics majors. They will be required to take at least one additional mathematics course, beyond what has been required of physics major thus far.

GOOD  
LUCK  
ON  
FINALS

## Building Vibrations Studied

Vibrations caused by trains or large trucks passing near a factory often shake the buildings and ruin the performance of costly, precision-made machine tools.

Industrial engineers at The Pennsylvania State University are studying the sources and controls of various types of mechanical vibrations which affect the performance of machine tools. The project is under the direction of Drs. A. O. Schmidt, professor of industrial engineering, Arthur D. Brickman, professor of mechanical engineering, and Inyong Ham, assistant professor of industrial engineering. It is financed by a \$21,800 grant from the Rock Island Arsenal, U. S. Department of the Army.

Precision machine tools are affected by such things as vibrations from other machines in the factory, outside disturbances from trucks or automobiles, or even self-excited vibrations, according to Professor Schmidt. Often the reduction in quality of machine

(Continued on Page 4)

## Arts Majors Continue Studies

A survey of the plans of last year's graduating class in liberal arts and science at City College indicates that at least three out of four members of the class are already doing graduate work on a part- or full-time basis, or intend to do so in the future.

The study by Dr. Sherburne F. Barber, Assistant Dean of the College of Liberal Arts and Science, notes that the increasing number of City College students who annually continue their studies on a graduate level, serves to underscore the national demand for trained people. However, the study states, because of the low level of family income, "most of our students would not be able to continue without some outside financial assistance."

Of the 919 students who partici-

(Continued on Page 2)

## Tutoring Coordinated By Freshman

More than 150 City College students have volunteered this semester to tutor children in remedial subjects at schools, churches and community centers in Harlem.

By teaching basic skills, such as reading and arithmetic, to youngsters who require educational encouragement and guidance, they hope "to give these children some kind of ambition, something to look forward to," one tutor said.

The projects were started during the past year by various student groups that wanted to help culturally deprived children in Harlem. Participants are required to serve from one to three hours weekly at schools and churches in the vicinity.

The tutors are enrolled in various voluntary programs sponsored by five undergraduate agencies: Sigma Alpha, an honorary service society; the Baruch School Committee on Human Rights; Student Government; and the college's chapters of the Congress of Racial Equality, and Neman Club.

The newest but largest program — only two months old — is sponsored by the Congress of Racial Equality. Coordinated by Dennis Raveneau, a freshman majoring in electrical engineering, the program benefits 60 Harlem youngsters.

Fifty City College students staff the CORE Program which is held afternoons Monday through Thursday in two Harlem churches.

In addition to teaching one or

two afternoons each week, the tutors attend training seminars every Saturday where qualified teachers help them prepare lessons for their pupils.

To gain insight into a child's specific problems tutors are instructed to watch for the most common pitfalls — word — recognition, vocabulary, spelling and comprehension.

The response at the Manhattan Christian Reformed Church at 122nd Street and Seventh Avenue is "amazing" said Mr. Raveneau, who at 17 is younger than most of the tutors he supervises.

The approach to the children is informal, he explains, "since one can't sit a child down with a book right away." The tutors and third to sixth grade children use a large room at the church. Here they play the piano, sing songs or play word games to become acquainted with each other. Only after child and tutor have developed a friendly relationship will the tutor begin to introduce formal academic instruction.

(Continued on Page 2)

## Public Colleges Receive Praise

Public colleges and universities have become the primary source of professionally-trained manpower in the United States, according to Dr. Gustave G. Rosenberg, chairman of the Board of Higher Education.

Writing in the December issue of the City College *Alumnus* magazine, Dr. Rosenberg pointed out that the two larger undergraduate sources of Ph.D.'s in the United States are public institutions — City College and the University of California at Berkeley.

He declared that there is "an inverse relationship between social and economic class and the earning of the Ph.D." He cited a study by former Queens College President Harold Stoke which found that "very few of the graduates of the so-called 'class' colleges — those frequented by the sons of the economic and social elite — go on to take the Ph.D. degree."

"These graduates may enter law school or go to Wall Street — they succeed to important positions in business, industry and government, but they do not follow academic careers and almost none of them become scientists," the Stoke report, as quoted by Dr. Rosenberg, concluded.

While the role of the private college is still important, Dr. Rosenberg said, "current enroll-

ment trends show that in the years ahead it will be the public institutions to which the nation must turn, to secure the masses of trained scientific, technical and intellectual manpower this country needs to keep it moving forward."

Dr. Rosenberg stated that there is a direct correlation between the location of new industries and the proximity of large-scale educational centers.

These industries differ, he said, from older industries such as steel, textiles, and automobiles in their production of items of small size but great value, such as transistors, magnetic tape, and pharmaceuticals. They are dependent on "brainpower" rather than on large labor pools.

California, New York City, and Massachusetts attract approximately 60 per cent of defense contracts for research, because they are "centers of learning," while Arkansas, Mississippi, and upstate New York which "need industry much more desperately" get few to spur industrial devel-

(Continued on Page 2)

## Board Approves Record Budget

The Board of Higher Education at its December meeting approved a record-breaking operating budget request totaling \$105,603,116 for all units of this City University (the doctoral program, the College Discovery Program, and Board units, Dr. Gustave G. Rosenberg, the Board chairman announced. The action was taken after the budget request was submitted to the Board by its Committee on Finance and Facilities. The total is \$23,592,174 above the current year's budget of \$82,010,942, approximately a 28.8 per cent increase.

The Chairman of the Board commented on the 'record-breaking budget.' "This request breaks the barrier of all previous requests," Dr. Rosenberg said, "for it is made to meet a record-breaking public need for college training personnel at the very time when the number of high school graduates in this City is also breaking all records. High school graduates in New York City are expected to number 85,000 in 1965, compared to 78,000 in 1964.

Given the funds we seek, the Board and the City University will meet their triple obligation to provide college and graduate education for the qualified, two-year technological training for those who seek it, and the dis-

covery of college potential among high school students and graduates whose grades do not reflect their native ability."

The overall total includes a lump sum of \$1,000,000 for additional freshmen; \$4,513,715 for doctoral programs; \$1,700,000 for College Discovery Program; \$75,674,693 for the senior colleges; \$19,284,262 for the community colleges; and \$150,000 for sabbatical leaves.

Of the \$4,513,715 requested for doctoral programs, \$3,200,000 is asked from New York State and \$1,000,000 from New York City. An estimated \$313,715 is expected from graduate tuition and other

(Continued on Page 3)



# TECH NEWS

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Editorial Policy of TECH NEWS is determined by a majority vote of the Editorial Board.

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## MAIL DEPARTMENT LETTERS

Dear Sir:

I have read with interest the views of Dean Allan as reported in your issue of December 7, 1964.

No one can disagree with the opinion that students — engineering or otherwise — should not engage in "campus life" to the degree where it interferes with their studies or academic standing.

Except for this limitation, I disagree with Dean Allan. Socializing; the ability to mingle agreeably and make one's self interesting and attractive to others so they take pleasure in being with you; the development of a sense of leadership which can be gained from active participation in campus life, are most important and may have a very definite bearing on ultimate success in your chosen profession.

The outstanding man — the one most likely to succeed — is the one who can participate actively in campus life and at the same time maintain a high academic standard.

Sincerely yours,

Max E. Greenberg,  
President, Alumni  
Association of the  
City College of New York

## Graduates . .

(Continued from Page 1)

pated in the survey, 696 — 77.7 per cent — said that they were already attending or planned soon to enroll in graduate and professional schools. "Approximately two-thirds of these 696 students," according to Dr. Barber, "will, most probably, be working and studying at the same time to defray the costs of graduate work." Of the remaining third, who will be studying full-time, 227 graduates reported that they had received a total of 390 awards and grants. These consisted of fellowships from private foundations, the State or other agencies, and university awards such as fellowships, assistantships, scholarships, and tuition waivers.

Included in the total of grants are 48 Regents College Teaching Fellowships. Awarded, on the basis of a competitive examination, to College seniors who are residents of New York State, City College and Columbia University led all colleges and universities in the number of graduates receiving these fellowships.

Also awarded to City College students were: four Fulbright Fellowships, ten Woodrow Wilson Fellowships (with nine honorable mentions), four National Science Foundation Graduate Fellowships (with 21 honorable mentions), and 15 National Defense Graduate Fellowships.

Although a detailed breakdown as to fields of study has not been completed, Dr. Barber indicated that the major area of graduate study pursued by City College liberal arts and science graduates are mathematics, the sciences, English and history. "The main outlets for these fields would be teaching or research," Dr. Barber stated.

# Vector Review

By BRIAN COHEN

The forthcoming issue of Vector, the City College engineering quarterly, is an information packed magazine well worth the twenty-five cents that no longer buys out Sunday Times.

The feature articles cover three entirely different subjects, each treated in a different style. "Co-hesion in Solids" by Edward Siegel, Physics '65, deals with a subject that concerns all phases of engineering in one way or another.

Unfortunately, Mr. Siegel jumped all too quickly into the mathematical analysis of the problem only to conclude that this approach has not yet been carried to a point from which conclusions may actually be drawn. We dislike rationalization, but it seems that most of the contributions by students other than engineers, lead us merrily (with adequate mathematical rigor) into a cul-de-sac of confusion. "A Study of Urban Transportation

Problems" by Harold Kasso, C.E. '65, discusses some of the problems encountered by designers of our great metropolitan areas that find themselves being choked by the same device that brought them life. This article though inconclusive and somewhat clumsy, makes for generally interesting reading.

The cream of the feature articles is provided by Anthony Genna of the United States Air Force and City College. The subject of "Inertial Guidance" is most skillfully examined and illustrated in a manner comprehensible to a freshman and informative to a senior. The field of Inertial Navigation provides the fulcrum for many travel on the earth and beyond could not have been handled in any finer fashion.

The "Vector Wheels" feature has returned again to spotlight some of the personalities that dominate the undergraduate academic scene. Featured are the presidents of the campus honor societies; Tau Beta Pi, Lock and Key, and others. This feature provides a panorama of the interest of the upper crust of the student body. We couldn't help wondering which books Mr. Tutelman read by Sherlock Holmes. (no offense Bob).

Vector Analysis, "The Greatest Poet," enlists George Bernard Shaw to immortalize the engineer and scientist as the poet laureate of modern civilization. The "Engineering Highlights" provide some interesting capsule summaries of recent developments. A removable insert is included that provides four full pages of useful conversation factors, the value of which transcends the purchase price of the magazine.

## Tutoring . . .

(Continued from Page 1)

At the second center, Baptist Temple Church at 116th Street, many of the twenty-five children were attracted to the program although they did not need remedial work. Many of them are actually reading above grade and appear to have above-average academic potential. Mr. Raveneau says his tutorial team is seeking to retain and expand the interests of these children so they will be encouraged to think of college enrollment later on.

He has begun a mimeographed literary magazine which incorporates stories, articles, and puzzles by the children. They are also encouraged to read novels and other advanced books brought from home by the tutors.

"Getting the children to leave when the session is over is a problem" said Mr. Raveneau. The project is beset with other difficulties, however. Mr. Raveneau indicated that many parents when approached by the tutors, are unwilling to permit or encourage their children to attend the sessions. Mr. Raveneau said that tutors achieve most success with children who are urged by their family to attend.

But in spite of these problems, Mr. Raveneau feels the program is accomplishing something. "The children get a great deal of fun out of it," he said. This is most important, he indicated, since "their greatest problem is in overcoming the defeatist attitude they develop when they see their own brothers and sisters, most of them school dropouts, on the streets without jobs."

"If we can show them that life is not hopeless," he said, "we will consider the program a success."

## Praise . . .

(Continued from Page 1)

oment, Dr. Rosenberg said. The Board of Higher Education chairman indicated his support of a proposal by Secretary of Labor Willard Wirtz to establish two years of education beyond the high school on a tuition-free basis.

"This need for research and professional training for a growing proportion of the labor force makes higher education essential to the national welfare," Dr. Rosenberg concluded.

## Final Exam Week

Finals week is almost upon us, and it has become clear that the plan to provide students with more study time is a majestic failure.

The idea was to eliminate classes during the week preceding finals to allow greater time for preparation, but the same time that this was done, the number of finals given during final's week was sharply decreased. These exams were rescheduled to be given during the last week of classes. Thus, the goal of creating more time for study has been thwarted and the opposite end achieved.

The majority of the student body now have most of their finals in class during the week that was to be for preparation. The only small improvement over previous terms is that faculty members may cancel classes in which finals are not being given that week.

Unfortunately, some faculty members are unwilling to do this, and thus we are in a worse predicament than before. As far as students are concerned, the present arrangement is no different from that of previous years. Particularly hard hit are students in their upper sophomore term or above. For such students, almost all of their final exams are now being given in class, and very often, one right after the other. Of course, these students do not have adequate time to prepare for their finals. To compound the problem, some departments are not strictly complying with the criteria for deciding whether a final should be given in class or during exam week. This puts students in other departments at a disadvantage in a competitive grading system such as ours.

We feel that it is necessary to have at least two "reading days" before final exams begin. These days could be obtained at the expense of intersession, or of holidays such as Columbus Day, Veteran's Day, Lincoln's Birthday, etc. We also feel that in class finals impose an unnecessary hardship on a great many students and such a final exam schedule should be replaced by a more equitable one. Perhaps scheduling the in-class finals after the regular final exam week, in addition to starting classes earlier each semester may bring some relief to the students.

## The Space Race



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# BOOKS

first expedition to Mars only the ruins of civilization. The explorers were able to solve a Martian equation as follows:  $5x^2 - 50x + 125 = 0$ . This was very strange mathematics. The value  $x = 5$  is legitimate enough but required some explanation. The Martian number system was based in a manner similar to how many fingers would the Martians had?"

is only one of over 150 mathematical gems compiled by vivacious puzzle buffs and university lecturer Angela Dunn in her book, "Mathematical Bafflers." A collection of the best problems from the famous "Problematic Recreations" series of Industries, together with a variety of provocative posers and especially for this volume which McGraw-Hill will publish today.

problems, selected for clarity, elegance of solution, imaginative appeal, range and beyond the very simple — those requiring no mathematical background — to those which would challenge the ingenuity of a professional mathematician. Clever solutions throughout the book are subtle clues to solutions and a humorous touch.

Dunn says her primary aim in writing this book is to provide, therefore, she has selected tedious solutions, well-known problems, duplication of problems from problem to problem, extremely difficult problems. Problems she has chosen are the unusual, the unexpected, and the non-obvious for those who "take pleasure in the exercise of reasoning, who enjoy solving their inventive faculties, who delight in the pursuit of proof."

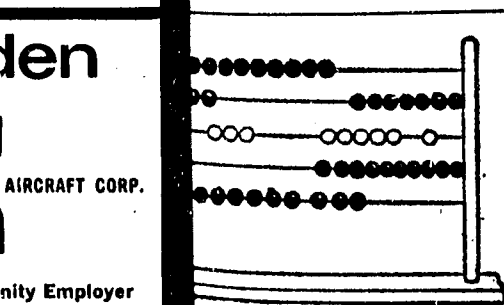
Among the types of problems in "Mathematical Bafflers" are: a series of exercises in algebraic reasoning; a variety of geometry problems; problems for those who like Diophantine equations; a variety of logic and deduction puzzles; probability problems; a collection of intriguing problems requiring only a flash of intuition to reach a solution; assorted number theory problems.

versatile Angela Dunn is Director of Problematic Recreations at Litton Industries in Torrance Hills, a weekly series of mathematical puzzles. The book, representing the original work and pet brain twisters of many skilled mathematicians and scientists, were contributed throughout the book and many other series.

"Mathematical Bafflers" is priced at \$6.50.

shall assume that the base number system is equal to number of fingers. If  $b$  is the number of fingers, then we can write the equation as follows:

$5bx + (b^2 + 2b + 5) = 0$   
 $5 \times 5 + 8 = 13$  and the Martians had 13 fingers.



## Budget . . .

(Continued from Page 1)  
 income. The total provides for continuance of the nine existing doctoral programs in chemistry, economics, English and Comparative Literature, psychology, biology, engineering, history, mathematics, and physics, and the initiation of three new ones in September, 1965. The three are: sociology, political science, philosophy or education.

The day session enrollments of matriculated undergraduate students in the senior colleges in fall, 1965, are expected to increase by more than 2,000 to over 41,000. To serve evening session matriculants, 94 annual teaching lines are asked for the Schools of General Studies and Evening Sessions. If the request is approved, the cost of providing these positions will be offset by an equivalent reduction of part-time teaching hours, resulting in a net cost of \$254,553. These annual lines are asked as the next step in providing a core of teachers on annual salary for the Schools of General Studies.

Negotiations are now under way for salary adjustments for staffs of the Board of Higher Education on a parity basis with those given Board of Education staffs under the recent agreement between the Board of Education and the United Federation of Teachers. The chairman of the Board was authorized to make the necessary changes in the 1965-66 budget request when negotiations are completed.

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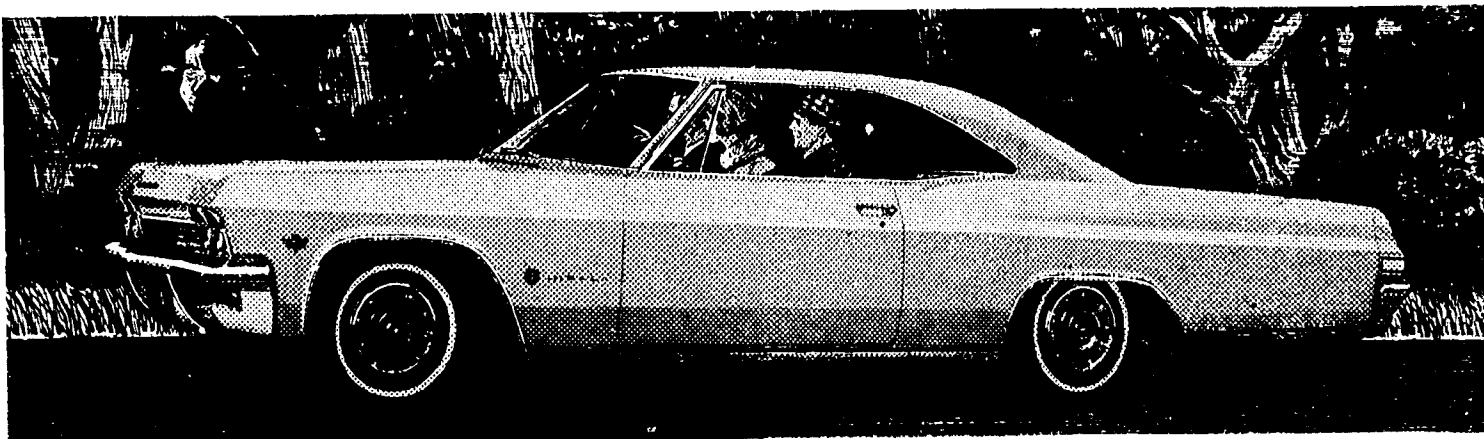
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## Vibrations . .

(Continued from Page 1)

tools is caused by a pliant floor in the shop, he said.

"We are working with the machines as they are being manufactured," Schmidt said. "The design of the machine can be quite adequate, but production engineers in the factories where they are used find that performance quality is not as good as expected. Poor installation impairs the precision of the machine tool."

The engineers are analyzing operating conditions on machine tools in an effort to determine which types of vibrations produce the difficult-to-detect irregularities in machined parts. Various mountings are also being tested.

Tests are being carried out at present on a 20 horsepower lathe with a variable drive and

direct reading power meter. This machine is mounted on vibration insulators. A smaller 10 horsepower lathe with variable speed drive is being used for comparative tests. The dynamic behavior of these lathes when cutting the same type of workpiece with different tools is being studied.

The tools under investigation include standard American tools as well as tools ground to Soviet and Japanese specifications.

"Anything from airplane parts to refrigerator motors or baby buggies are made on the same basic types of machine tools," Schmidt explained.

"If you are concerned with something like a tractor the problem is perhaps not so great. If something goes wrong with the machine, you just shut it off."

"But the performance of a jet-engine during flight is something else."

### DOUBTING THOMAS?

### HOPEFUL AGNOSTIC?

Christianity has more to offer than hope, it has positive proof in the form of a MIRACLE which was foretold, described and is intensely personal. Ask the Religious Leaders or send me a card marked ESP-17. My reply is free, non-Denominational, Christian. Martyn W. Hart, Box 53, Glen Ridge, N. J. 07028 (USA).

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The testing showed that our cable covering wouldn't be attractive to pholads, and in nearly fifteen years of experience with undersea telephone cables we have peacefully shared the ocean bottom with them.

But we had to be sure we could. In the telephone business, reliability is

everything. We must do all we can to safeguard service from interruption. No threat is too small to ignore, not even that posed by a tiny mollusk.

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We have to run.



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