



TECH NEWS

SCHOOL OF TECHNOLOGY

CITY COLLEGE OF NEW YORK

VOL. VII No. 5

THURSDAY, DECEMBER 5, 1957

By Student Fees

OUTLOOK ON EMPLOYMENT

Cutbacks in defense spending in the past year have forced many companies, particularly aircraft manufacturers, to reduce the number of new engineers they were planning to hire; a few firms have had to lay off engineers. These layoffs are reflected in the increasing number of former City College graduates returning to the placement office for help in relocating themselves. Because of this and other reasons, this term's graduates will find their range of employment choice among companies a bit less than that of last term's graduates.

Perhaps coming too late to change the outlook for this term, is the increasing missiles program. Money for that program won't reach missiles manufacturers until next year. Some of these companies may increase the number of engineers they plan to hire, others will just wait and see.

Also on the asset side is the fact that the tremendous federal highway program is just getting into full swing this year. This fact is pointed up by the increased number of job offerings from cities and states for their highway departments. These civil service agencies, which have found it very difficult to compete with private industry in the past, have generally raised their starting salaries in an attempt to fill their expanding requirements. The highway program has made it easier for the civil engineering graduate to find a position than any graduate of the other engineering branches.

The young engineer who is amenable to a position outside of the New York City and Long Island area will find his choice of the type of firm best suited for his needs and talents much greater than

(continued on page 11)

E-DAY DATE, CHAIRMAN, & STAFF ANNOUNCED

Saturday, March 22, has been announced as the date for the annual Engineers Day. Chairman of the 1958 event



Marc Caspe, E-Day Chairman

will be Marc S. Caspe who has already lined up the key members of his staff. They are:

COORDINATOR — William Kallman
PUBLICITY — Stanley Small
TOUR MANAGER — Ira Langenthal
FORUM MANAGER — Lou Cooper
FACILITIES DIRECTOR — Leonard Appel

Department Chairmen:

CHEM. ENG. — Ronald Rothenberg
CIVIL ENG. — Frank Luzi
DRAFTING — Phil Siedenberg
ELECT. ENG. — Arthur Gelb
MECH. ENG. — Robert Plumer

A staff conference revealed that during the second week of the spring semester a drive will commence to obtain the volunteers necessary to make E-Day successful. At this conference, Caspe stressed the unique feature of this campaign. For the

first time there will be an opportunity for everyone, upper and lower classmen alike, to render their services. The plan, as outlined, will have the lower classmen, freshmen and sophomores, act as tour guides. Since most of them are unfamiliar with the tour layout, provision will be made to thoroughly familiarize each guide with respect to laboratory locations and functions. It was mentioned that herein lies an excellent opportunity for the lower classmen to learn first hand of the laboratories they will use later on.

As for the upper classmen, they will be relied upon to serve as lab chairmen and demonstrators. Whether it be working on an analog computer, a lathe, the electroplating apparatus, or the universal testing machine — a great time is always had and it is hoped that many will volunteer as soon as the drive begins.

To complement the program of laboratory and shop tours, forums will be conducted in Townsend Harris Auditorium. Topics such as the engineering curriculum

(continued on page 5)

IRON CURTAIN ENGINEER TO SPEAK TO SWE

Everyone on Campus, it seems safe to guess, has some preconceived notion of the technologically trained person's existence behind the Iron Curtain. Most of these ideas come from newspaper and magazine articles which present statistics on prices in terms of working hours, hours spent in school and subject matter taught.

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TECH NEWS

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THE EDUCATION OF
AN ENGINEER

No one can deny that contemporary society is a technical society. The development of mankind through competitive and rational application has resulted in our present civilization. So many things are wanted by so many that each man must become a specialist; the contemporary individual is required to do one thing so well that others will not have to do it.

And of all men, the services of the engineer are becoming the most desired. Contemporary civilization is a result of applied rationality and the engineer is the

applier of rationality to all things. Only through him can the needs of the mass be satisfied; it is he who thinks in terms of mass production and mass consumption. In the western world, where new things are always wanted and man's ambition runs wild, the engineer aids in the development of science and in finding new applications of science to ordinary living.

The obligations of the colleges are broadening. The primary purpose of the colleges is to educate; education by itself will develop the individual. Those interested in engineering will be educated and developed as engineers. It is obvious that more graduates of the engineering colleges are needed, but this need must not be satisfied by just an increased output. For the colleges to cater to the needs of industry would be cultural suicide. Engineers trained (but not educated) to comply with the demands of business will never think as engineers have traditionally thought. Businessmen are profit makers. The engineer is a designer, applier, and planner. In our present society, the engineer is largely employed by business to aid in the acquisition of profit by the company, but the engineer's thinking and planning, if he is mindful of his social obligations, must transcend momentary profit or corporate gain. The entire engineering corps should consider itself as planning for an infinite future. There must be things for today's profit to buy tomorrow; what is cheap today may not be later, and the engineer must consider this as being more important than contemporary savings. The college then must educate the engineer as an engineer, not a servant of industry. And it must be the aim of all influences on the engineering student to make him self-reliant and dedicated. He must above all remember that the demands of business need not be his aims. Fortunately, the profit makers do not control all engineering and there is a need for the purely creative engineer. It was creative engineers who entered a not very promising field and developed the

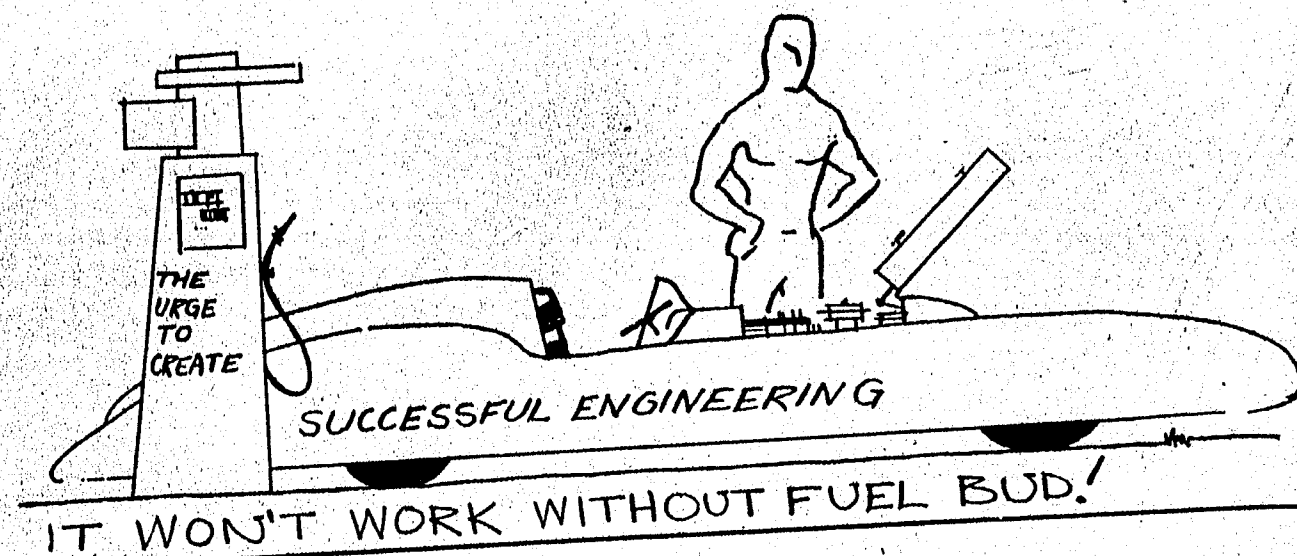
industry of aviation. Bridges are not built for profit, and it is unlikely men will go to the moon and expect financial reward.

At present the engineering student is taught two years or more of the basic sciences. As a concession to the finer things of life, he superficially studies the arts. In his later years, the student is taught engineering. These engineering courses are, with a few exceptions, extremely practical, very specific, commercial and inadequate. The engineer with a bachelor's degree is highly uneducated and no one ever expects him to be creative or potent.

Even though his education is more intensive than that of most other college students, it is not as intense as contemporary standards require. Frankly, only graduate work develops creativity and the required intensive knowledge. Only if the engineer's future employer will train him can the B. E. degree holder become a capable engineer. In a way this is proper, for if business wants a specific kind of engineer, let business pay to train him. However, this kind of relationship tends to destroy the flexibility of the engineer.

If the colleges are to continue to educate the tech man as they are now doing, let them at least let the student realize his limitations. He should at least understand the creative process. Part of his motivation should be to find new and better methods to perfect. Otherwise, the student will be useless. Because of the need, noncreative are hired, but the creative are sought.

The Red Cross' Bloodmobile will be at Finley Center today collecting blood for the C.C.N.Y. blood bank. If you're pledged don't neglect giving. Over 21's can give although not yet registered. The quota is 400 pints.

CCNY HOW
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In the last issue to write a series other municipal order to do so q to students wh School of Techn sent to 100 of t Since 50% of t ferred from Bro expected that t turns would be attended Brook of the answers dents who had College. The re at best, obscure subject would like to express took the time to

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CCNY HOW GOOD?

BROOKLYN COLLEGE VS CITY

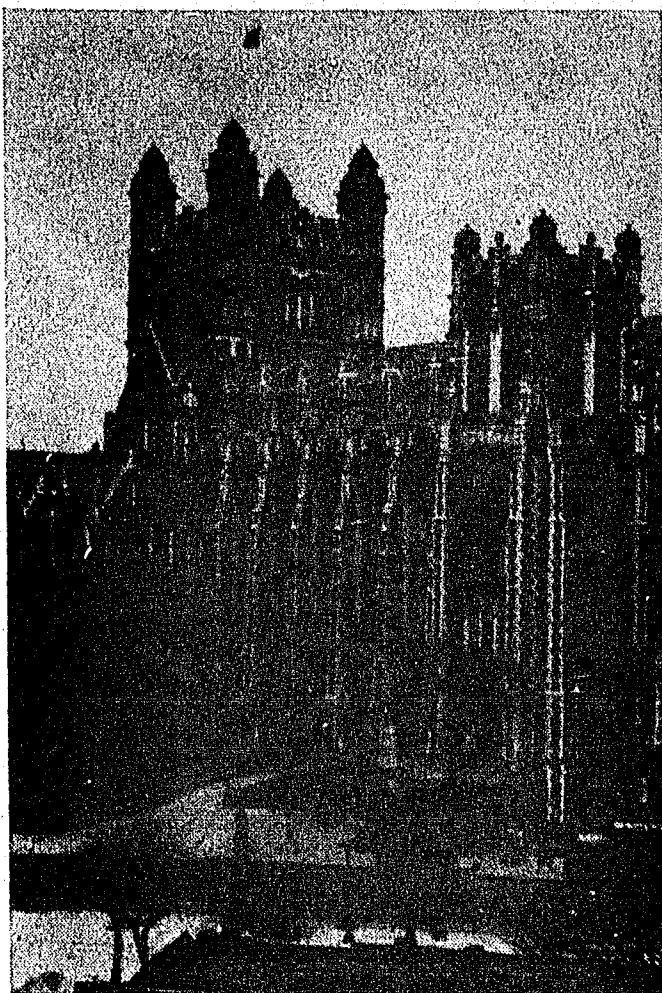
In the last issue we explained our plan to write a series of articles comparing the other municipal colleges to C.C.N.Y. In order to do so questionnaires were mailed to students who had transferred to the School of Technology last fall. These were sent to 100 of the 150 transfer students. Since 50% of these students had transferred from Brooklyn College, it had been expected that the largest number of returns would be from Tech-Men who had attended Brooklyn. To our surprise most of the answers received were from students who had transferred from Hunter College. The reason for this would seem, at best, obscure and any opinions on the subject would be of interest. We would like to express our thanks to those who took the time to answer the questionnaire.

Questions were asked concerning the curriculum, teachers and student activities. Most students who had attended Brooklyn College felt that the pre-engineering preparation given there was equal to that given at City. Some noted that subjects such as mathematics were not sufficiently stressed as to define their proper importance.

When asked the outstanding difference between Brooklyn College and City, many students stated that since the engineering subjects were electives at Brooklyn the classes were small and perhaps enabled the teacher to key his lessons more closely to the average student and yet provide for those needing special help. On the question of student-teacher relationships the answers varied greatly. Some felt that the relationship was much closer at Brooklyn due to the smaller size of the school and classes. Others commented that the instructor-pupil relationship is closer here because the teachers are often younger and are more empathetic in their approach to the students' problems.

Although all agreed that the work is harder at City, many feel that this is no reflection on the science training received at Brooklyn. A typical reason given was, "At Brooklyn during my first two years I essentially made up the liberal arts requirements for my degree. When I transferred to City I was hit with a complete program of engineering courses, so naturally the work is considerably harder."

The pet gripe of the ex-Brooklynites was the lack of lounges on North campus. It was stated that "by the time the Tech man arrives at an attractive South campus lounge, he has to start hiking north for his next class."



Tough Place for Newcomers

On the whole, these students have adjusted well to the College, although many of them report that they are conscious of a lack of understanding of the fine arts on the part of the average CCNY tech student. This is perhaps particularly noted by them because of their own background at Brooklyn, a liberal arts institution.

In the next issue we will discuss the differences between Hunter and City, which seem more pronounced. In a later issue we will be able to discuss the Technological University of Budapest, in Hungary, thanks to the response of another transfer student.

HOWARD WHITE

An expanded Vector, on sale today and tomorrow, concentrates on "Summer Jobs." Included is a symposium conducted with four summer-experienced Tech-Men and an article by Mr. Saul Brenner, formerly of the Placement Office, illustrating the employer's point of view. In addition, the usual Vector features and a pictorial survey of the U. S. Army Corps of Engineers. That's today and tomorrow.

MAX LERNER:
ENGINEERS

Scarcely a week passes without the papers featuring a Washington big-wig's speech, a university president's plea, or a citizens' committee's report on the theme of the engineers. All of them lament the shortage, refer to our being left behind in the race, and exhort young Americans to lay aside their idle dreams and get busy with slide-rule and feedback mechanisms. But does all this ballyhoo and panic about an engineering shortage have any basis in fact?

So begins an article in the July issue of Pageant Magazine entitled "Is your son being high-pressured into engineering?" by Max Lerner, Professor of American Civilization at Brandeis University and columnist for the New York Post. The article is a rather biting survey which points out that the shortage is not of engineers but of broadly trained people who can think on their own about the whole complex human problem rather than a specialized technology. Note that this article was printed before the lay-off of technical personnel had begun.

A recent study by the Engineers' Joint Council, taking a good sample of the 450,000 engineers in America, has some discouraging figures to show about their pay, even in this era of urgency, the article declares. At mid-career their median salary is about \$10,000 a year; at the start, after a year, it is \$5,300; it gets up to \$14,000 only after 30 or 40 years of work, and then only in the higher ranges of skill. As a group, says the report sadly, the income of the engineers is not much better than that of carpenters, electricians, plumbers, and bricklayers. But the engineers themselves have an added complaint. A study of the American Institute of Electrical Engineers spells out their feeling that their work is routine, that they are recruited with promises of a caviar sandwich on the moon. But once they settle down to their job it becomes routinized, they are not called on for participation in company policy nor even informed about it, and they have become glorified helpers on an operation whose basic decisions are made by others.

The article continues to point out that although the figures vary wildly, we are turning out about 25,000 engineers a year while the Russians are turning out closer to 65,000. The trouble with getting into a panic about these figures, Mr. Lerner states, is that if we do, then we allow the Russians to choose the ground on which they will compete with us — the

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ground of sheer numbers of technical personnel. One might point out, of course, that the Russians started terribly late in the race for industrial power, and that they have had to go inhumanly fast in order to catch up with us at all. The real battleground should be of our own choice — not just how many engineers, but the breadth of their knowledge and interests, the depth of their humanity, the kind of people they are or the society in which they operate. On their own chosen ground of numbers the Russians can beat us hollow. And as for the Chinese, with their half-billion or more of population to draw upon, they in time can beat us hollower.

Looking at the roster of the big scientific names in the history of our atomic weapons — Einstein, Mautner, Fermi, Szilard, Bethe, Teller, Von Neumann, and many others — you will find that they are men and women who were drawn here by our open society and who worked in the spirit of freedom. The Russians pay their scientists well, place everything at their disposal, and treat them as the top elite, but the one thing they cannot offer is the boon of an open society. If we are to keep this society open, we shall have to strengthen rather than weaken, the elements of our educational system which can turn out rounded human beings, and not just narrow and specialized technicians. Dr. John Burchard, Dean of Humanities and Social Studies at M.I.T. is quoted as saying, "We cannot compete with the Soviets on the basis of numbers. Our strength lies in the preparing of men who are unafraid to think for themselves." And he warns us that if we train men to think for themselves we have to pay a certain price for their freedom: "They are troublesome. Some will have off-beat political ideas and may not be clearable in any government. And will be querulous of many human actions. Their work has trained them into thinking that impoliteness is not always unvirtuous." But if we are afraid of their spirit of free inquiry, he added, "we throw away the only thing that can in the long run preserve us against the mass man of the East."

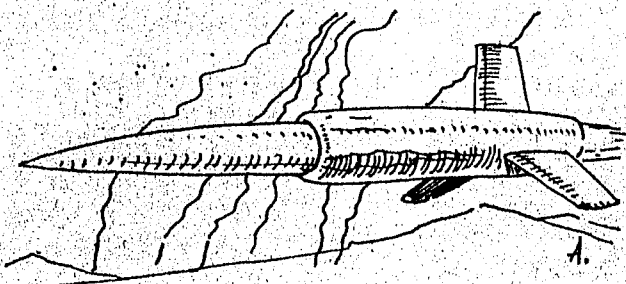
Dr. Maynard M. Boring, who is in charge of technical personnel development for General Electric, as well as President of the American Society of Engineering Education, has done some plain speaking about the familiar estimate that we need 68,000 more engineers for industry today. "I think there is too much water in these figures," he says. If industry got the extra 68,000, "they wouldn't know what to do with them. If we had a ten percent drop in our economy, we would have engineers raining out of our ears." He too makes general education, rather than narrow technical specialization, the

AMERICAN ROCKET SOCIETY STUDENT CHAPTER FORMING

With the current interest in rockets, it has been suggested that a student chapter of the American Rocket Society (ARS) be devoted to the advancement of jet propulsion, rockets, missiles and space vehicles. The national organization was organized in 1930 by America's rocket pioneers. Since then it has grown to a membership of 6000.

The scope of the Society's interest includes propulsion, combustion, electronic guidance, high temperature metallurgy, upper atmosphere research, structures, propellants and fuels, aerodynamics, hypersonics, astronautics, space law, space medicine, and other related fields.

Among the benefits for student members are: the opportunity to attend the annual meeting of the ARS and the student conference held every year during the first week of December in New York.



At this meeting, he may compete for the \$1000-ARS student award for an outstanding paper on any field of the Society's interest.

At meetings of the student chapters members will hear authoritative speakers on every phase of jet propulsion and astronautics, and will see outstanding films on these subjects. Trips will be organized to visit rocket installations in the N. Y. area.

key to the solution. The purpose of education is to bring out the deepest, broadest, and best potentials in a student.

At any rate, a look at the figures for the graduating classes will find a crop of 36,000 engineers for 1956, an increase of almost 50% over 1955. The engineers are coming. What we need now is not more of them, but more broadly based ones, who know about the world they live in, and are not just thrashing about blindly, each in his own corner of the contemporary jungle.

Whether we have more engineers or fewer, the fact is that there will be some rough going for America and the world in the decades ahead. We shall need the best talents and wisdom of all the human

A member receives monthly two ARS publications on "Jet Propulsion," containing papers on research and development written by the nation's top scientists in the rocket field. The other journal "Astronautics" gives a broad interpretive coverage of the field. Among its recent features have been articles on Project "Vanguard," the "Sputnik," Space Medicine, Space Law, "Miracle" Fuels, and the ICBM.

In addition he receives annually the Roster of Members, a Missile Directory, on products used in the field, and a compilation of "Careers in the Rocket and Missile Industry."

Finally, he can join two of the seven Technical Divisions of the ARS. These are: 1) Liquid Fuel Rockets; 2) Solid Fuel Rockets; 3) Propellants and Combustion; 4) Electronic Instrumentation and Guidance; 5) Ramjets; 6) Human Factors; 7) Space Flight.

The sixth group is headed by Major G. Simons, M.D., U.S.A.F., who ascended last summer in a balloon to 100,000 ft. altitude and remained there for 24 hrs.

Petitions have been placed on the E.E., M.E., Chemistry, Physics, and Biology Dept. Bulletin boards. All engineers, natural science, pre-med and psychology majors are invited to join.

Anyone having further questions on the scope and membership of the ARS may contact Mr. Zeiberg of the M.E. Dept.

If student interest is adequate, a chapter will be formed at the College and those who expressed an interest will be notified.

B. ZAUDERER, ME '58

material we have. Our problem is to tap the still untapped resources of our population in order to discover top-flight minds who can be trained broadly and who will ultimately do creative work in whatever they turn to.

The urgent need of mankind today, and of America as part of mankind, is not more technology but more social intelligence. And we will develop that intelligence only if we become a great culture, not a magnified ant-hill of technicians and conformers. The aim of education, as it has been put, is not to develop "technically accomplished zombies," but men and women who know something about both the tragedy and the promise of the human condition.

Dear Editor:

On December open, either to What is Student Tech men? Who have answered

Student Go and on all subjects Education and very last election for four Student is neglected by

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LETTERS TO THE EDITOR

TECH MEN IN STUDENT GOVERNMENT

Dear Editor:

On December 11, 12, and 13, we will be called upon to vote. Two choices are open, either to go our own merry way as we usually do, or take some sort of interest. What is Student Government? What actions of Student Government affect us as Tech men? What is the situation as it exists now? These are the questions we should have answered now.

Student Government, no matter how unrepresentative it is, speaks for all of us and on all subjects. It is the only unifying element between the schools of Technology, Education and Liberal Arts and Science. I call it unrepresentative because in the very last election very few people participated. In the senior class there were openings for four Student Council Representatives and only two ran. Any government, which is neglected by its constituents loses sight of its purpose and goals.

There are three branches of Student Government, the Executive, Legislative (Student Council), and the Judicial (Courts). Up till now the Courts haven't functioned, in fact last term some members of Student Government didn't even know they existed. The purpose and procedure of the court are only known to a few. Student Council's job is to pass resolutions and has the power to appropriate money directly or through the Fee Commission of which it elects four members. In the Executive Branch, you have the President and the Executive Board. These people are the only ones who know what is going on. Under the Executive Board you have all the agencies and bureaus. There are ten agencies and many of their functions overlap. These agencies are responsible to the Executive Board. The procedure has been that the heads of the agencies have been recommended by board and council approves. What does it all mean? It means that the people you elect will be charged with all this responsibility. The activities are run by the agencies. There is no coordination between agencies, student government and the organized societies, fraternities etc. It is only very recently that we had a report on the activities of these organizations; generally, we never have any. The Administration charged that two such Agencies had been infiltrated last term. Either we take cognizance of the importance of the elections as well as what goes on all term, or possibility of such things happening again is very likely.

The Personal Development Program as run by T.I.I.C. is an idea which we received through the National Students Association. It cost us \$800 to send a delegation to its annual meeting. Last term, in the May 16 issue, Campus reported that six individuals had been elected to the City College delegation by Student Council. However, this was not the same delegation that went. The Executive Board had acted in an emergency session and had reversed the last decision of council. The by-laws state that such action must be announced at the first meeting after the action was taken — this was never done, and we did not have any Tech men at the convention, nor were student body informed of this action either.

Some of the other actions that affect us monetarily are the phone bills, which, during several months last term went as high as \$60 a month, and the approval by Student Council to reimburse part of the expenses which John Kasper (segregationist) would incur if he spoke at City. However, even though the membership ruling will continue, I am sure the policy of Student Council will be to see that sometime in the future it will be rescinded. If there is any success on this matter with membership lists, surely Student Council can take a lot of the credit.

With more engineers on Student Council we can make it a more efficient organization as well as a better one. There is a lot of time wasted at meetings — like debates on whether a member of council should be reimbursed 50¢ for dinner because he has to pay for it and not his parents when he stays late.

The mechanics for good government are down in the constitution, but we see that if you neglect your responsibility no matter how good anything is on paper it will fail on December 11, 12, and 13, know the issues, know the candidates and if possible run yourself.

Yours truly,

MAX ZASLOWSKY

Chairman of Internal Affairs Committee
of Student Council representing class '58
Member of T.I.I.C. representing A.S.M.E.

E-DAY...

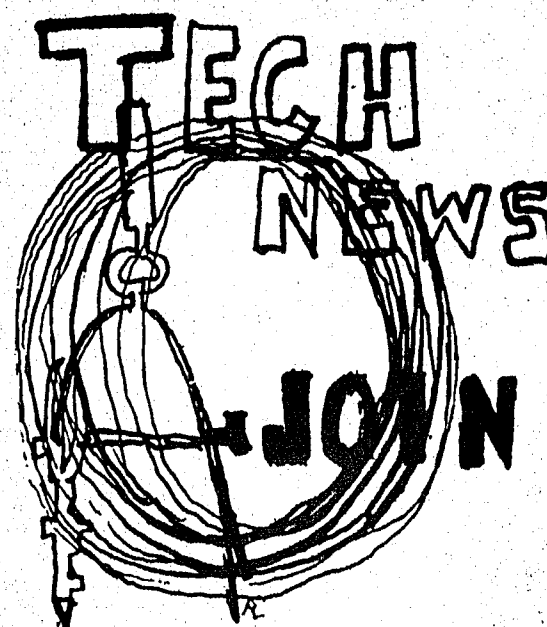
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will be discussed. Further, any questions our guests may have will be answered.

Among the most important people to be invited to E-Day will be members of industry. During the entire morning and afternoon they will be given ample opportunities to talk to our students and inspect our facilities. Also to be invited will be New York's high school seniors, and, of course, relatives and friends.

As has become the custom, refreshments will also be served.

STANLEY SMALL



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In the NEW
Record Dept.
of the
City College Store

If the American today no longer dreams of owning a white clapboard cottage with green shutters and a shingled roof, that revolution can be largely credited to a single man — Frank Lloyd Wright. Although leading architects throughout the world have been influenced by his work since at least 1910, it is only in the past decade that it has been popularly accepted in our own country. Many regard him as the most important man yet born in America; he is an American product, as assuredly as the "ranch styles" and "split levels" which abound in our suburbs are descended from the "Prairie Houses" Wright began building in the midwest more than half a century ago.

Wright is best known today for the pioneering he has done in the uses of materials, flexibility of ground plans and wide-ranging innovations, but there are important beliefs underlying all his work which have never been as widely understood.

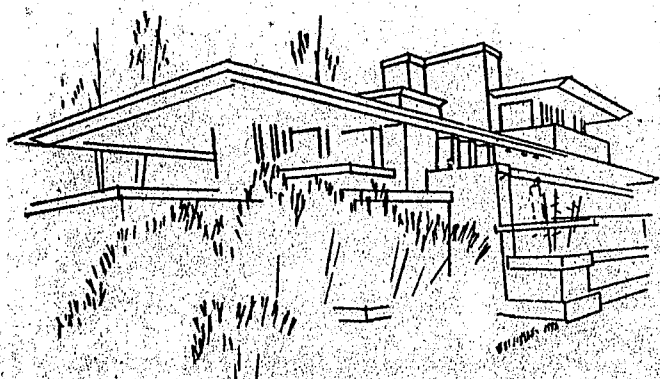
While Wright's own statements on the subject may seem contradictory to some, each of his buildings is a clear statement of the architect's guiding philosophy: Organic Architecture.

Briefly, Wright sees a building as analogous to the living plant. It is firmly rooted to the soil in which it belongs, it takes its shape from the terrain, its form is integral and with no meaningless appendages, the form is developed from internal requirements — Wright always designs starting with the *space* within — and most important to the architect, it symbolizes continual growth. Going beyond the analogy of the plant, he sees the organic house stressing honesty to the nature of its materials, that is, no material is used to imitate another.

Wright's fidelity to this creed will be observed as we review some salient points of his career.

EARLY CAREER

It was in 1889, after four years of studying engineering and architecture, that Wright went to work for Louis Sullivan, one of our foremost 19th century innovators. He worked with Sullivan on designs for the influential Chicago World's



Robie House

Fair of 1893 and stood by Sullivan when the Fair's sponsors decided to emulate Washington, D. C., and build an electrified city of white, classic fronts.

The Classic Revival which followed doomed Sullivan and might have ruined Wright's career as well if he had not earlier established himself as a designer of private homes. As it was, he felt bound to continue his master's work in purifying the building of ancient trimmings and raising its comfort and beauty to the point that modern materials allowed.

The houses Wright built in and around Chicago in the following twenty years are only now receiving their deserved attention. One magazine recently, devoting an issue to Wright's work, included an article on the ornamentation, varied and developed by the architect like themes of a symphony. A pattern of squares in glazed ceramic tile on the exterior wall is found with variations in the porch railings, the trellises and various architectural features. It might be noted that only in the '50's are architects experimenting again with glazed ceramic sheathing.

MOST INFLUENTIAL HOUSE

Another of these, the Robie House (1909), has been called the most important house built in America in 100 years. *House and Home Magazine* said of it, "Without this house, much of modern architecture as we know it today might not exist. Here Wright demonstrated such diverse ideas as the open plan; the combination of windows in continuous strips; the use of inside-to-outside-walls. Above all else, the Robie House is a magnificent work of art." Until this month it was to be razed for the construction of a school dormitory.

In 1920 the Imperial Hotel in Tokyo was completed. Wright's basic material for this was a common clay used for street paving and not thought dignified enough. Wright won out, by arguing that the clay would so enhance the building as to increase Japanese respect for their own resources at a time when they were copying Western ideas to the point of their physical discomfort.

The Hotel is a marvelous illustration of Wright's concept of planning walls, floor and ceiling as a continuity. Stiff floor slabs were cantilevered over centered supports, as a waiter balances his tray. Wright credits this feature with being most responsible for saving the building in the 1922 earthquake.

AMAZES AUTHORITIES

Almost thirty years later, in the Administration Building for the Johnson Wax Company, a somewhat similar column

IN SEARCH OF A CREATIVE ATTITUDE

PORTRAIT OF A CREATOR FRANK LLOYD WRIGHT

RESEARCH AND INTERVIEW BY BOB



was used. This one was of reinforced concrete, 22 feet high, carried about 100 tons and stood on a metal tip 9 inches in diameter embedded in the floor. Before building authorities watched skeptically, Wright had 60 tons of material piled up for a test column. They were convinced of its soundness. Secret of its strength: wire mesh, welded into a cone.

The forms of architecture are impenetrable to appreciate through words or pictures. A building can be experienced only by moving through it, reacting to its atmosphere, being impelled toward its path or towards many. To most people the first opportunity to experience a Frank Lloyd Wright building will come with the Solomon R. Guggenheim Museum, which opens in New York in 1958.

WRIGHT IN NEW YORK

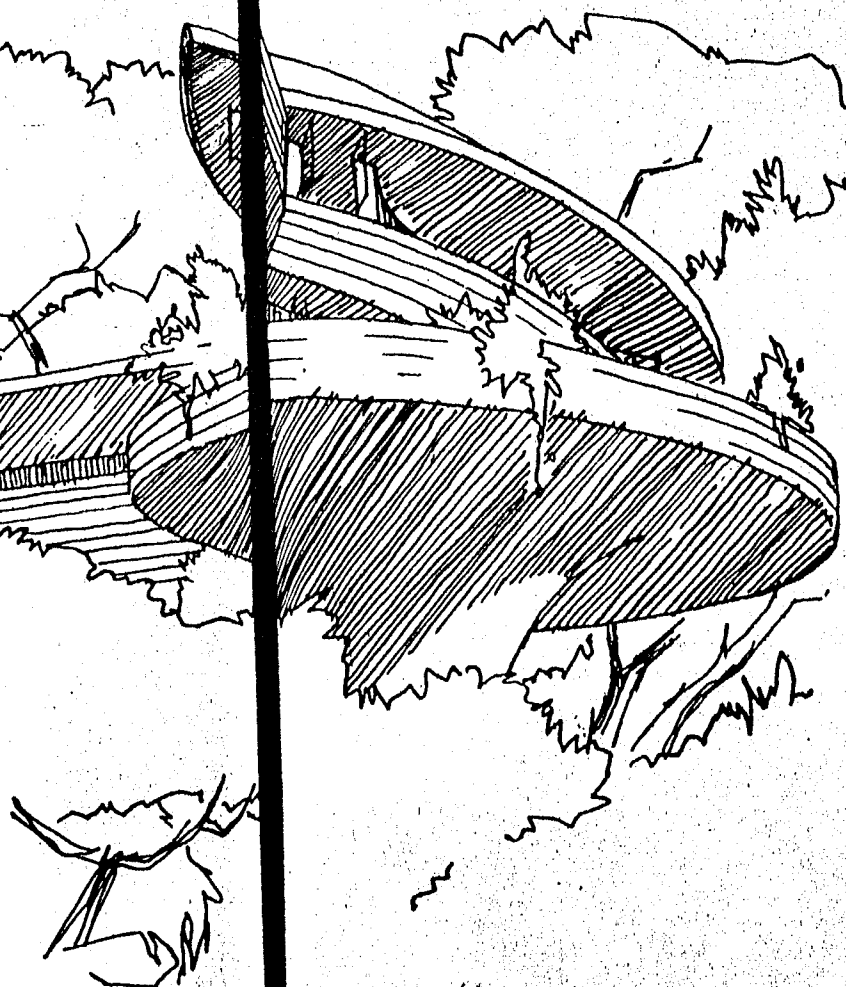
At present Mr. Wright is in New York working on the Guggenheim Museum. A reporter, sent to interview him, found him in a midtown hotel where

A CREATOR:

TRAIT CREATOR

NK LO WRIGHT

AND INTERVIEW BY BOB AMSTERDAM



one was of reinforced concrete, which left his head visible. Mr. Wright's eye was a metal tip 9 inches from the floor. He was more crowded than one would believe for a man of 88.

He speaks slowly and deliberately, giving the impression of polishing each sentence before uttering it. He appears reversed in the interviewee's role and is carefully to allow each statement to be recorded. To one familiar with Wright's invaluable writings it is observed that he frequently paraphrases his printed statements. Always the words suggest a poetic grandeur seldom encountered in this age.

He delights in describing the Guggenheim Museum as a "revolutionary" building. This is because "it is intended to break the rectilinear frame of reference which has held artists and painters enthralled for many, many years"; as he also indicates with a hand the spiraling shape of the building. It was Mr. Guggenheim's intention, says Wright, "to create a place in which

IN NEW YORK

Mr. Wright is in New York on the Guggenheim Museum project, sent to interview Wright, "to create a place in which

modern art could be shown in its proper atmosphere." In this gallery the paintings, unframed, will rest on walls which slant outwards toward the ceiling. The result should be the same as seeing the paintings as they stood on the artists' easels.

Mr. Wright, in New York, is staying in a suite decorated with many antiques, in the midst of what a Victorian would have considered Imperial comfort. It is a setting in sharp contrast to his home, Taliesin, in Wisconsin, or the many homes he has designed and furnished. (He prefers to design his own furniture also, although he admits "All my life my legs have been banged up somewhere by the chairs I have designed. I have done the best I could with this 'living-room chair,' but of course, you have to call for somebody to help you move it. But we are accomplishing it now. Someday it will be well done. But it will not have metal spider-legs.")

INDIVIDUALIST

Mr. Wright has stressed built-in furniture as part of his integrated design as early as 1913, but his chairs have long been notable for an awkward, boxy look. Perhaps this is because he believes sitting to be in itself "an unfortunate necessity, not quite elegant yet."

It has been said that if Wright were three inches taller all his houses might have had entirely different proportions.

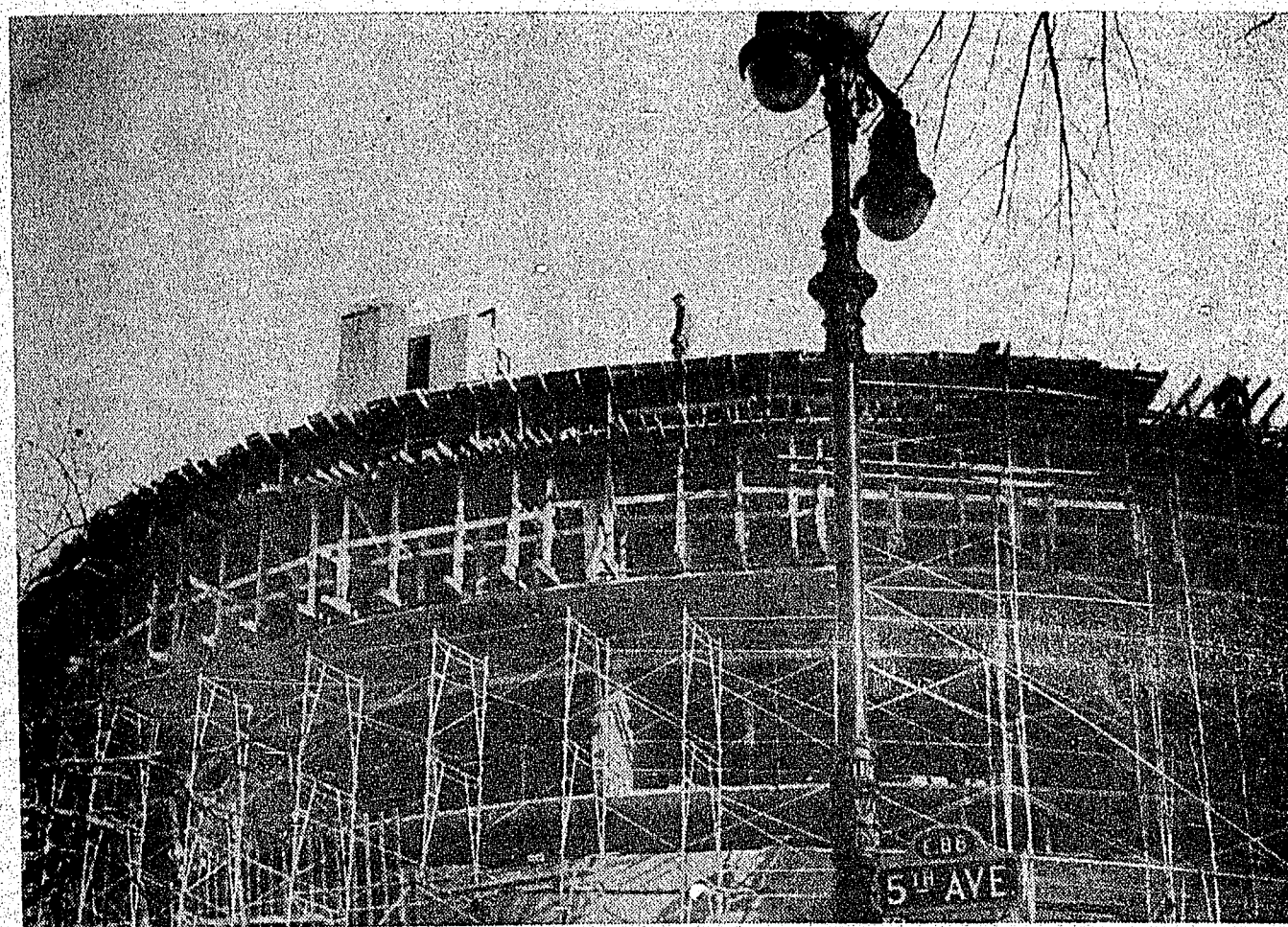
"Probably," agrees Wright. As it is he believes in conserving space within the

room by keeping ceilings under eight or nine feet high until they spring to the full height of the building, for example, to accommodate a view. A person of 5'8½" would feel comfortable in all of his rooms "designed to human scale." Mr. Wright, it happens, is 5'8½".

It may be gathered that Mr. Wright has made his reputation partly by being an individualist. He resists being drawn into a line of questioning he does not like. He would not, for instance, indicate in any way which of his buildings he felt to be outstanding or to best exemplify his work. He steers the conversation firmly toward the work that is still on his drawing board. He will say of his countless achievements that to each he gave his best effort while it was in his hands. "Does a mother choose her favorite child?" he asks.

He then begins to discuss the mile-high building he has envisioned for Chicago. It is a building he would like to see along Lake Shore Drive, supplying all the office space needed for the city and allowing many acres to be cleared and returned to woods and parks. "It will be a great, practical and profitable undertaking," he says firmly. "The spirit of Chicago today is low, but it will return. This will be built."

What does Mr. Wright think of the role of the engineer in our society? He has mixed ideas about the good that engineers are accomplishing for the world. On learning that the writer is studying electrical engineering he gave congratulations, saying "There's an important job to be done in that field."



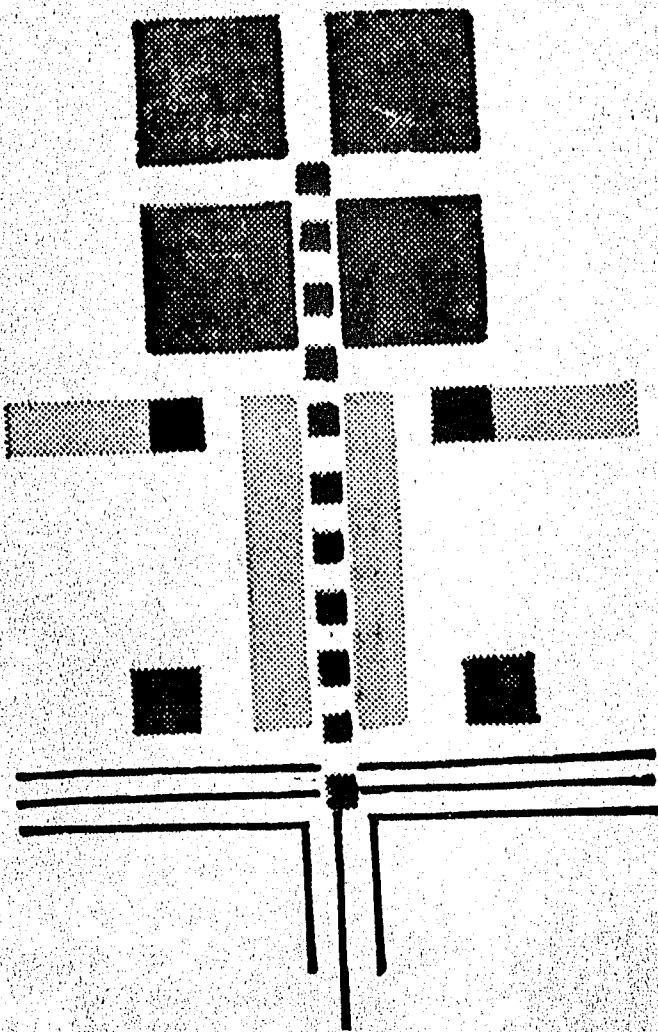
Guggenheim Museum Being Built

Earlier, however, he pointed out the danger he felt existing in automation that became economical only when a large number of identical products were produced and consumed.

"Quality and quantity seldom stay together," he said. "It seems that quantity has been getting ahead more often lately.

"Conformity will bring the end of Democracy, Democracy which was a means granted us by our forefathers to assure the sovereignty of the individual."

The ideal of individual sovereignty under a democracy has been one of the strongest influences in all of Frank Lloyd



Wright's work. Comfort and dignity for the individual are goals he has always striven for. Even in housing projects he has designed for the government in recent years — usually of four-family apartments — entrances and terraces were arranged so that each family could feel that the entire building was its own home. For the individual client he has always sought to make the man's home his castle to the extent that it would give the owner pride and pleasure. Mr. Wright has a strong antipathy to the dwellers of an apartment house civilization, and the voices of senseless numbers, the "mobocracy" he calls them, he has fought throughout his career. "Thomas Jefferson," says Mr. Wright, "saw that the hope of Democracy lay in education, so that people could not be corrupted by the vote-getters, nor the tyranny of the numerical mob!"

Mr. Wright felt that other parts of the world were almost as careless of the indi-

CHI EPSILON NATIONAL HONORARY CIVIL ENGINEERING SOCIETY

Realizing that civil engineers have an unparalleled responsibility towards society, two groups of Illinois engineering students set about to create an honor fraternity that would develop and encourage the fundamental principles of scholarship, practicality, character and sociability, which, combined, would make for a conscientious, searching student, and a successful, imaginative professional engineer.

The two groups united their efforts and aims, and the Chi Epsilon fraternity was founded. It was incorporated as a national Civil Engineering fraternity on February 13, 1923. Since that time the fraternity has grown to 49 chapters throughout the country and over 12,000 members. City College was granted a charter in 1949 when it became the 30th chapter to join the fraternity. Since then, the fraternity has worked to aid the Civil Engineering faculty and student body through pledge projects which are used as aids to teaching and through Chi Epsilon's tutoring program which is used as a supplement to teaching.

In addition to electing to membership those students who have met the requirements deemed fundamental to the successful pursuit of an engineering career, Chi Epsilon also elects to honorary membership and alumni membership those professional engineers who, by their career of service and devotion to the profession and by their personal integrity and honor, have exemplified the ideals of the fraternity.

vidual as our own. "However," he said finally, "others do not try to do as much as we. After all, the more you have to do with, the more you are done for." Mr. Wright enjoyed his last remark, and tried to repeat it correctly, so that it could be copied down verbatim.

Critics of Wright say that too often he tries for theatrical effects; that he is working in the tide of a Romantic tradition; that his buildings are too dark; that the eventual extension of Organic Architecture would be a craggy cave. The fact that he has left a deep impression on his era is past disputing. It will be the job of his followers to show if Wright was merely a genius with a vision unique unto himself, or, indeed, the herald of a new architecture which could enrich the life of every man.

The pledge projects, which are assigned to the new members after their election to the fraternity and which must be completed within the 10 weeks before the official induction dinner, vary from the construction of a flow net, studying the characteristics of flow under a dam, to tramping around the sewers under CCNY with Professor Bernard Kaplan, to determining the quantity and density of the flow of sewage. This term, some pledges are working on the construction of a bridge built to exact scale from blueprints.

Chi Epsilon, as a group, and its members, as individuals, are traditionally active in the various engineering activities at the college. Both the chairman and the coordinator of E-Day are members of Chi Epsilon. Last year the fraternity won second prize for its exhibition at the Activities Fair.

And so, through its participation in every phase of student and engineering life, Chi Epsilon continues working towards the fulfillment of the dreams and aims of its founders.

B. K.

Assoc. Editor of Trans.

TECH RUSSIAN TO BE OFFERED

A noncredit Elementary Russian course will be offered at City College next term. The course will be given on Monday and Wednesday evenings from 5:15 to 6:25 by Miss Alexeieff, who teaches Russian at Manhattenville College. It is open to day and evening session students, teachers, or anyone else; the tuition fee will be \$30. The elementary course is designed for those desiring to read technical Russian, and it may be followed the term after by a Technical Russian course which may have credit value.



A.I.Ch.E. is holding its semi-annual smoker tomorrow evening, Dec. 6, at 8:00 P.M. in Finley 220.

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High School Confab

City College, on November 16 together with Brooklyn and Queens Colleges took part in the Fifth Annual Scientific and Engineering Career Conference. The Conference, which attracted more than 1600 people to City College, was sponsored by the Technical Societies Council of New York, with the cooperation of the New York Engineers Committee on Student Guidance, and the New York City Public and Parochial Schools.

The Conference started with a brief welcoming assembly at 9:30 A.M. Pres. Buell G. Gallagher expressed the aim of the conference as an attempt to show high school students and their parents the educational opportunities available in science and engineering. The President was followed by Prof. Kenneth J. Moser of Stevens Institute of Technology, President of T.S.C. of N.Y., who stressed that the need in engineering is of quality rather than quantity. Dean William Allan (Technology), the final speaker, praised City College as having some of the finest engineering and science laboratories anywhere.

After the assembly the visitors attended one or more of nineteen panels, each of which discussed one of the ten different professions with which the Conference concerned itself. Many of the panels crowded with visitors to the extent that not only two but three sessions were held between ten and twelve o'clock to accommodate the interested. The basic sciences, such as Math., Physics, Biology, Chemistry and Earth Sciences had a greater attendance than was expected. This was possibly because of the emphasis on the basic sciences in the daily press of late. The engineering attendance was good, and about as expected.

High school students seemed attentive during the panels, with many of them taking notes. The questions they asked were of a general nature and covered a wide range of topics. Two popular interest-areas were salary, and preparation and qualifications for college. In at least two different panel conferences the question of language was brought up and it was stated that the preferred technical languages for future scientists and engineers were English, Russian and German.

Many college groups participated in

SURVEYING SURVEY
OR
SATURDAY'S TERROR

Van Cortlandt Park, in the upper part of the Bronx, is the home of City College's North North Campus. There at the city line, budding civil engineers take their first course in surveying, C.E. 101, every Saturday morning at 9 o'clock. Often, it is raining or snowing outside; however, with an inoperative phone in the fieldhouse, all students are still expected to be on time, even if it is only to discover they

painted white so that their color will not clash with the snow.

As there is no breakage insurance on the equipment used, the students must pay for anything broken or damaged. The school does have insurance to cover loss of equipment, and for that reason, all students follow the rule: "If you break it, lose it." There is a true story of a young engineer standing near a door and holding a \$500 transit under his arm, when another student on the other side of the door opened it. Transit and door came together and then transit and floor. Few people know what happened to the young engineer who broke the transit, but there is a rumor that once deprived of his transit, he left the School of Engineering and finished out his college career in obscurity as a book-binding major. Then, there was the student who discovered that a range pole does not make a good javelin — it breaks too easily. For his record-breaking (pardon pun) toss, this athlete was awarded a gold medal entitling him to pay for the range pole.

In spite of all the difficulties, the surveying course offers many rewards. High on the list, are the many people you get to meet in the park — bird-watchers, cross-country runners, Brownie troops, and golfers from the nearby course whose golf balls went over the fence. Also, you learn such highly technical skills as how to correctly wind the string of a plumb-bob around the plumb-bob when you have finished using it; how to keep a level level as it sinks in the mud; and how to keep small children and dogs from running beneath the legs of a tripod.

Students are also taught safety measures. Last term a squad was taping the distance between the tops of two slopes, one on either side of a bridal path. The measure was about eight feet above the bridal path. Suddenly, a mounted policeman came galloping down the bridal path. Only quick action by the squad members saved the policeman from decapitation by the steel tape.

If outdoor life inspires you, and you like to give up half of your weekend, why not take C.E. 101 — you can fill my vacancy, I'm dropping out!

JULIUS SOLLER

BRUCE PODWAL



are being dismissed. Generally however, the students work in the rain or snow. When there are four or more inches of snow on the ground, the sight of thirty students trying to find a small, painted symbol on a rock can only be compared to watching a search for a needle in a haystack. Naturally, the symbols are

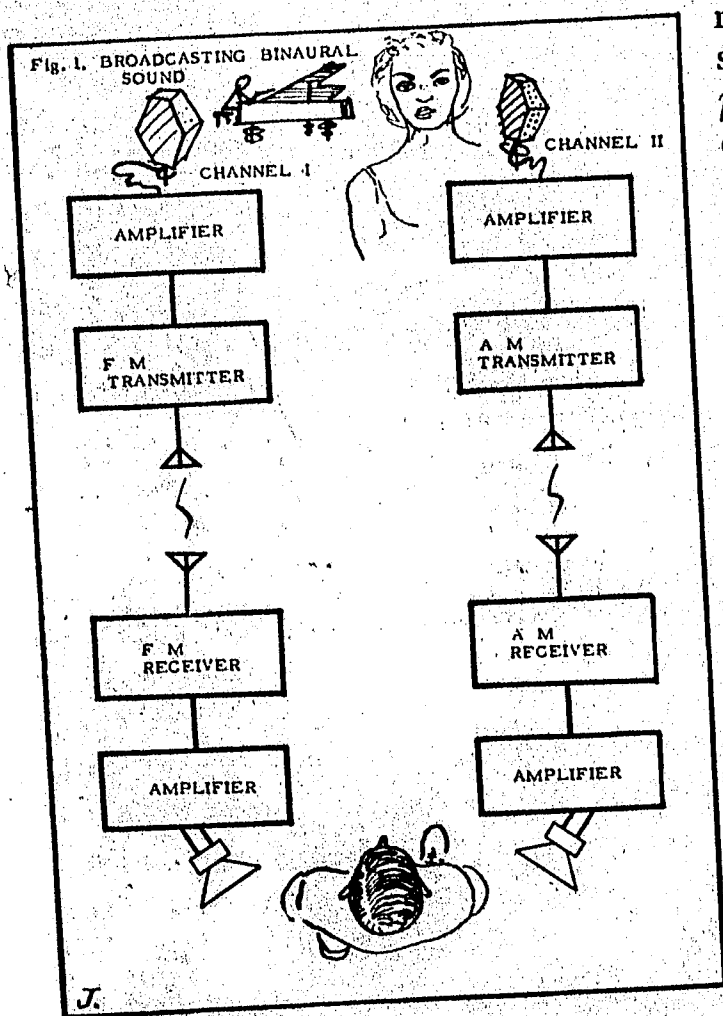
making the Career Conference a success; among these are A.I.Ch.E., the Physics Society and Eta Kappa Nu. Professor Harold Wolf, Assistant Dean of Graduate Studies; and the director and coordinator of the Conference at City College, wonders why it is that technology students tend to be so apathetic when an opportunity arises for extra-curricular activities for their benefit or for the benefit of the College. If more College students had volunteered their services the Conference could have been an even greater success than it was.

BINAURAL SOUND JUST AN ILLUSION

BY WALTER SALM

Just what is high fidelity? Ask a dozen different "experts" and you'll likely get a dozen different definitions. No one has yet come up with an answer that is 100 percent acceptable. Many will say that high fidelity is a completely faithful reproduction of the original sound. Others may define it as concert-hall realism. Such statements are fine on the record jackets, but both are equally far from the truth.

Using the word "audio" is perhaps preferable to "hi-fi", since today's high-pressure hucksters and backhanded advertisers have rendered the latter term



almost meaningless. A good audio system can *not* achieve faithful reproduction of the original sound. While tremendous advances have been made in the past few years, there are still many obstacles to be overcome. First of all, the acoustics of a living room cannot even approximate those of the concert hall. Secondly, the construction of a loudspeaker, while skillfully designed and planned, is still a seriously limiting factor.

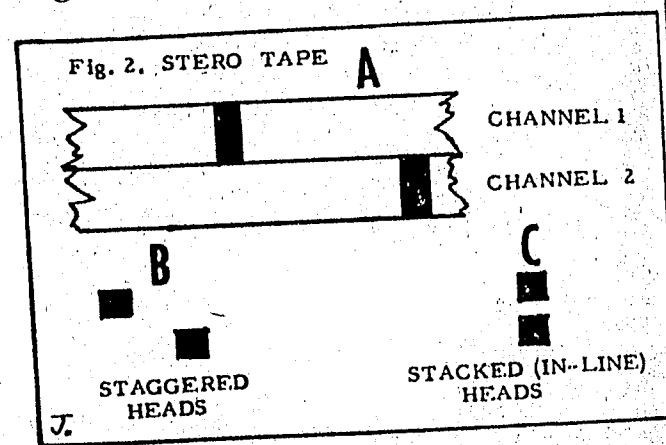
What then is high quality sound reproduction? It is simply an *illusion* of realism, and the better the components of an audio system, the better this illusion will be. One method of adding to the total illusion is a system known as *binaural* or *stereo* sound. The theory of binaural sound is that the listener hears with two ears. At a recital, such as the one

shown in Fig. 1, the vocalist is heard predominantly by the right ear, while the piano is heard primarily by the left ear. This gives to the listener a feeling of depth, placement, and dimension. He can close his eyes, and still accurately determine the relative positions of the performers. Binaural reproduction brings the dimensional perception of this live performance into the living room. The piano music in Fig. 1 is picked up by the left-handed microphone, amplified and transmitted by FM radio. The vocalist's voice is picked up by the right-handed microphone, amplified and transmitted on AM radio, entirely separate from the FM sound channel. *The two separate microphone channels do not touch or mix at any point.* They are picked up by separate FM and AM receivers, amplified separately and fed to separate loudspeakers, usually placed about ten to fifteen feet apart. Sit back and close your eyes. The organ is obviously on the left, the singer on the right. She starts to walk while singing. She walks toward the other microphone and back again. *You know exactly where she is at every moment.* The illusion is complete.

There are other methods of achieving binaural sound that are in some respects more satisfying. Using the same setup of separate amplifiers and loudspeakers, it is possible to use specially recorded tapes and disks for sources of program material. The recording can be made with one microphone channel on one half of the tape, the other channel on the other half, as shown in Fig. 2a. Of course, double playback heads must be used on the tape recorder. Many recorders come already equipped with this feature, while most monaural (single-channel) recorders can be used as binaural playbacks with a stereo conversion kit consisting of a second head and pre-amplifier. For various

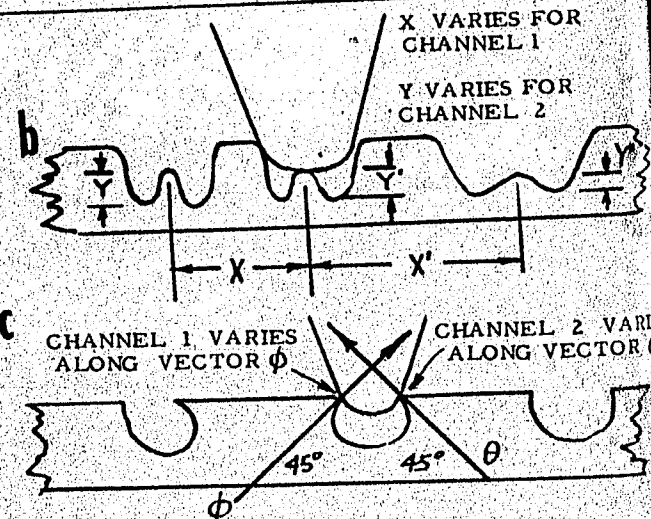
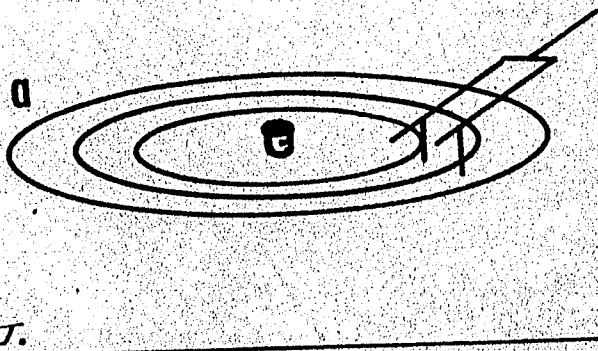
reasons, manufacturers of binaural tape machines have had differences of opinion about the positioning of the playback heads, hence the "stacked" and "staggered" arrangements in Fig. 2b and 2c. As a result, binaural tapes must be issued both stacked and staggered, and the manufacturers and dealers are not too happy about the resultant double inventory that becomes necessary. The stacked heads are rapidly gaining ground, however, and it is doubtful that the tape companies will continue production of staggered tapes for very long.

Another method of binaural recording, much older than stereo tapes, is illustrated in Fig. 3a. The two-band disk worked rather well, but technical problems, and the halved playing time of the record killed the idea. Two recent developments in binaural disk recording are quite a bit more practical. The new systems use the *same groove* for both channels. Both require specially designed pickup cartridges, but just a *single cartridge* and a *single needle* in each case.



The first system, successfully demonstrated at the recent audio show in New York, is shown in Fig. 3b. One channel is conventionally recorded in the *lateral* variations of the groove. The second channel is recorded in the *vertical* movement of the floor of the groove. The cartridge differentiates between the two types of motion, feeding the signal from the lateral motion to one amplifier and speaker, while the signal from the vertical motion goes to the other amplifier and speaker. These disks are not yet commercially available, and to date, no one has

Fig. 3. (a) EXPERIMENTAL STEREO DISK USING TWO PICKUP CARTRIDGES. NO LONGER IN PRODUCTION. (b) AND (c) TWO EXPERIMENTAL SINGLE-STYLUS STEREO DISK SYSTEMS THAT HAVE BEEN SUCCESSFULLY DEMONSTRATED.



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started large-scale manufacture of a suitable cartridge.

Fig. 3c shows single-groove system that uses a cartridge of extremely exacting requirements. Both channels are recorded laterally, but at 45-degree angles to the horizontal, one channel on each side of the groove. The stylus moves two coils that are concentrically mounted on the shaft through the field of a 4-pole magnetic system with the end result that each of the coils develop signals for the two separate channels. This system has been extremely successful both in laboratory tests and demonstrations, and many experts believe that it will eventually be the one adopted by the record industry as its standard for binaural disks.

Of all the methods of reproducing binaural sound, tape seems to be the best-suited medium, as well as the most foolproof. The disks, ultimately far less expensive than the tapes, still fall short of being completely perfected, and require not only a special cartridge, but may very well demand a special turntable and arm as well. The tape mechanism makes no such demands on an audio system. It can be switched in and out of the system at will. The same deck can be used for playback of both binaural and monaural tapes, and can record monaural sound.

The broadcasting of binaural sound is a fine idea, but the very fact that one of the channels must be transmitted on AM destroys a great deal of the illusion. AM is definitely *not* high fidelity, and as a result, the program loses its presence and appeal. There is a method of broadcasting both binaural channels on FM known as *multiplex*, and it will be described in more detail in the next issue.

(To be concluded)

FUNCTION: Military Ball
SPONSOR: R.O.T.C. Officers Club
TIME: 6 December, 1957 - 9 P.M.
PLACE: Sheridan McAlpin Hotel

- ★ The entire R.O.T.C. Corps, basic as well as advanced corps students are invited to attend the largest Military Social function on Campus.
- ★ Entertaining music will be presented by "Emile" and his band.
- ★ The "Queen of the Ball" will be chosen from the young ladies attending. She will be given several gifts and become "Honorary Cadet Colonel."
- ★ A favor will be presented to each couple as a remembrance of the Ball.

IRON CURTAIN ENGINEER...

(continued from page 1)

Yet few of these surveys present their material on the personal level; what is the emotional effect on the people living under such a regime, what sort of social and industrial god is the Engineer and what are his rewards for success or failure?

The personal aspects of a particular societal life must come from someone who has lived it. Mrs. Sima Miluschewa will speak about the "Iron Curtain Engineer" on Monday, December 9, as a guest of the Society of Women Engineers. She was a successful Soviet engineer until 1942. She is now chief research engineer for Curtis Wright, originating all research

in Aerodynamics, Acoustics and Machine Design and is presently working on the reduction of noise in the new commercial jets. She is the editor of the ASME newsletter in New Jersey. She teaches calculus two nights a week and studies for her Doctorate two more nights each week.

When the Germans invaded Russia in 1942 she was taken prisoner and shipped to Germany where she spent 3 years in a POW camp. As the Russian armies were advancing to "liberate" the prisoners, she fled to Munich, (a month's trip) on foot. In 1950 she came to the United States where she began a new and again outstanding career.

The meeting will be held in Harris 106 at 6 p.m.

JUDITH PERRY



OUTLOOK...

(continued from page 1)

will the engineer who doesn't wish to leave this area. In the past, the majority of City College graduates have tended to stay in the Metropolitan New York area. Several companies from the Far West are finding that the expense involved in holding these interviews is not justified, as the number of graduates willing to go west is very small. And at this moment, at least one firm which offered many posi-

tions with no acceptances has canceled its proposed campus interviews.

Whether the highway program and the revised missiles program will offset the reduction in aircraft spending and the effects of the City College engineering graduates' desire to stay near home, and perhaps increase the ratio of positions open to the number of applicants, remains to be seen. Both Mr. Schnaebele and Mr. Lockum of the placement office feel that we can do no more than wait and watch, and that only the future will tell just what the situation is to be.

BRUCE PODWAL

MECHANICAL ENGINEERS HEAR TALK ON ROCKETS

Mr. Robert Ellison, senior project physicist at Reaction Motors, Inc., spoke to an audience composed of ASME, SAE, and ASTE members. Mr. Ellison's lecture was concerned with power plants necessary to launching a satellite, some problems in rocket design and oxidizers and rocket fuels.

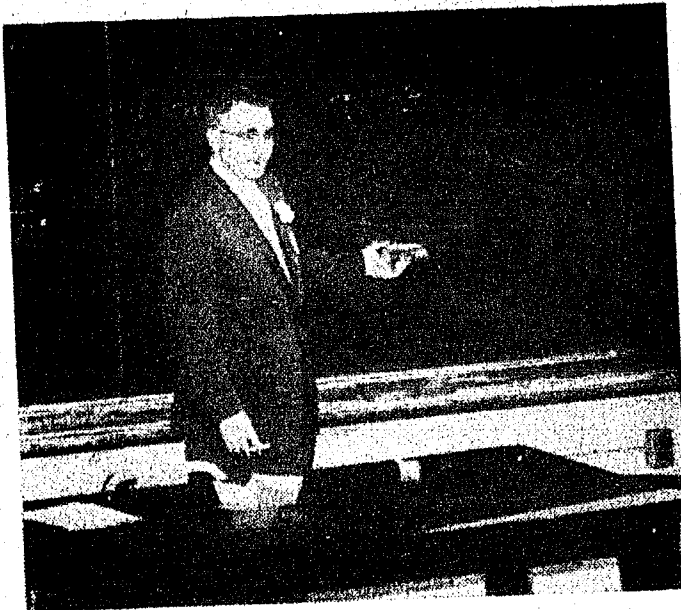
Starting with the jet engine, Mr. Ellison explained why this type of power plant would prove extremely inadequate in the more rarefied atmosphere. At high altitudes, a jet engine consumes more than three cubic miles of air per minute. To launch a satellite, a more practical method would have to be used.

In order to put a satellite into an orbit a more efficient power plant would be necessary. This suggests some sort of power plant which is not dependent upon the amount of air in the surrounding region.

Rockets, according to Mr. Ellison, were used thousands of years ago by the Chinese. The fuel that was used is believed to be some sort of impure ammonium nitrate. Today, with highly combustible fuels and with the aid of extremely powerful oxidizers, the problems that have to be met in rocket design are tremendous.

The major problem is the one of temperature control. When the fuel and the oxidizer are poured into the combustion chamber, the temperature of the mixture rises to about 4500° . The walls of the combustion chamber must be kept cool, because they will melt at 3500° . In order to solve this problem, the heat transfer data of the cooling fluid must be known. Ordinary data which is compiled for boilers is practically useless. The rate of heat transfer in an ordinary boiler is 0.0001 BTU per second per square inch, whereas in a rocket, heat is transferred at the rate of 10-15 BTU per second per square inch.

Mr. Ellison named several oxidizers that might be used in the combustion chamber of a rocket. Among them is hydrogen peroxide. No one would want to bleach their hair with this, as it will burst into flames upon contact with most materials. It is very difficult to contain this oxidizer. It must be kept in a pure aluminum or a specially treated glass container. Hydrogen peroxide was first used in 1917 as a torpedo fuel. Liquid oxygen (LOX) is also used as an oxidizer. Another oxidizer which is used is concentrated nitric acid. As might be expected, the acid used as an oxidizer in the combustion chamber of a rocket will be more concentrated



than the nitric acid found in the chemistry labs. Some experiments have been conducted to determine the efficiency of liquid ozone (LOZ) as an oxidizer.

The fuels used in the combustion chamber are generally gasoline, kerosene or alcohol. The latter was used as a fuel in the German V-1 and V-2 rockets and also in the United States' Viking rocket.

Once the 5,820,000 parts of a rocket are assembled, the problem of igniting the fuel and oxidizer without blowing it up arises. Two fine streams of fuel and oxidizer are allowed to meet, and the rocket is on its way. Once the rocket is above the earth's atmosphere, it can be guided by changing the direction of the exhaust.

PHIL BARNETT

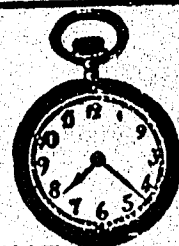
John's City College Barber Shop

4 Barbers — No Waiting

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OPPOSITE CITY COLLEGE

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SANDWICH SPECIALTIES

SPECIAL RATES FOR
CCNY STUDENTS
WATCHMAKER AND
JEWELER
LORENZO MAY
1623 AMSTERDAM AVENUE



SOCIETY OF AMERICAN MILITARY ENGINEERS

The Society of American Military Engineers is a national professional organization of both engineers and military men interested in the problems of military engineering, and as such the society functions as an important liaison between the Corps of Engineers and the engineering professions. In addition to this, most ASME posts sponsor student posts in colleges and universities where R.O.T.C. is given.

The SAME post here at City College is concerned with the development of its members in both the military and in the field of engineering; to do this it functions in both the School of Technology and the Department of Military Science and Tactics. Membership in the organization is attained through a selective pledge program which also gives the Society a fraternal nature. The pledges are not required to be in the School of Technology but must be R.O.T.C. cadets. Upon completion of the pledge program the cadet becomes a member of the Society and is permitted to wear its emblem on his uniform, a red, black and white fourregent worn on the left shoulder.

Last year, as part of its program, the SAME participated in the Engineer's Day program by erecting models of the various types of bridges used by the Army. Its program last year also included a trip on a New York Harbor dredge boat, and an excursion to the Corp of Engineers camp at Fort Belvoir, Va.; a similar trip is planned this year to Fort Leonard Wood, Missouri.

The SAME post at the City College is one which the entire School can well be proud of. In addition to running a fine program for its members, it brought honor and recognition to City College in being chosen last year together with another chapter as the best SAME student post in the country.

HERBERT L. HILLER, ME '66

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