. . . . . OF INTEREST

CHEMISTS VIE WITH NATURE

Providing America at war with ample rubber will be a race between Mother Nature and the chemical industry, with the latter rated as having the best chance. Dr. F. W. Went, distinguished Caltech professor of plant physiology, told the Sigma Xi meeting held at the Atheneum March 11, that the chance of finding a new "miracle plant" that will produce rubber is slight.

He revealed that there is seed available for planting of 70,000 acres of Guayule, the desert rubber plant, which will produce 500 pounds of rubber per acre a year after four years, the period of maturity. However, an acre, at the end of the first year, should produce approximately 200 pounds.

Dr. Went visualized a production of 10,000 tons of Guayule rubber a year during the early stages, compared to normal American consumption of 600,000 tons.

With plant sources limited, Dr. Went expressed the belief that the chemical industry will come to the rescue with synthetic rubbers. This will be especially true if costs can be reduced.

As for Brazil, the scientist declared that rubber there is in maximum production. He disclosed that the Russians have developed a rubber plant that yields 350 to 500 pounds per acre a year.

The reason he discouraged the idea of discovering a new miracle rubber producing plant is that the earth has been pretty well combed for all available sources. If anyone announces discovery of a new rubber plant of value it can be tabbed as a brainstorm, Dr. Went concluded.

CALTECH RESEARCHERS DEVELOP METHOD OF IMMUNIZATION SERUMS

Production of immunization serums in a test tube is the amazing and far-reaching feat that has been accomplished quietly at Caltech, it was revealed early in March for the first time. The news already has been hailed by medical men as one of the more outstanding new developments in recent years.

The discovery opens up the possibility of a new method of the medical profession's fight against disease. Formerly it has been necessary to secure immunization serums from animals.

The Caltech investigators have not yet carried their experiments far enough to find out whether or not it will be possible to prepare solutions in the laboratory for practical use, but work along these lines is underway. However, those engaged in the work are optimistic about this practical outlook.

Those working on this project have been Dr. Linus Pauling of Caltech, Dr. Dan H. Campbell, noted University of Chicago professor, Dr. David Pressman, research fellow in immunochemistry, and Mr. Stanley M. Swingle, teaching fellow in chemistry.

Excerpts from Caltech's official announcement of the vital research follows:

"It has been known for many years that the body is able to protect itself against disease, and that artificial protection against disease by vaccination or immunization can also be achieved. Until very recently the machanism of this protection against disease has not been understood in any detail.

"During the past two years, however," the Caltech men "have not only obtained experimental information which provides support of a detailed theory of the mechanism of immunization, but have even succeeded in making in the laboratory substances, called antibodies, which are responsible for protection against disease and which hitherto have been made only in the animal body.

"The picture . . . formed as to the mechanism of protection against disease is the following one:

"There are produced in the animal body certain large molecules, called serum globulin, which are present in the blood stream. If a bacterium or virus is in the body at the point where these molecules are being formed, the molecules are so changed as to assume structures complementary to those of the bacterium or virus, and in this way they acquire the property of combining with the bacterium or virus. These changed protein molecules, called antibodies, remain in the blood stream after the original bacterium or virus has been disposed of. On the later infection by bacteria or virus, these antibodies are able to combine with the invaders and to assist the body in destroying them.

"The procedure followed by the investigators at Caltech in manufacturing antibodies in the laboratory was to unfold normal protein molecules, the protein used being serum globulin, and then cause the molecules to fold up again in the presence of the antigen, which in this way is able to impose on the protein molecules configurations complementary to its own.

"The antigen is the substance which plays the role of bacterium or virus in disease. The unfolding of the protein molecules was accomplished with use of alkali or heat or some similar agent, which was then removed slowly, permitting the molecules to refold. In presence of the antigen they fold up in such a way as to acquire the facility of combining the antigen.

"It was found that a protein solution subjected to this treatment acquired the various characteristics of a natural blood serum which would be obtained from an animal which had been immunized with the same antigen. The investigators have prepared in this way antigen bodies against various simple chemical antigen, and also against pneumococcus polysaccharide."

MILLIKAN RETURNS FROM COSMIC RAY EXPEDITION

Dr. Robert A. Millikan, and his associates, Dr. William H. Pickering, and Dr. Victor Neher have recently completed a successful expedition to Mexico for the purpose of investigating cosmic ray effects.

Their observations were aided greatly by a specially built laboratory-on-wheels, which was practically self-sufficient. Equipment consisted of a superhetrodyne receiver, a directional antenna mounted on the roof of the truck, and elaborate test panel. The last performed the charging of the batteries, electrical testing, and the calibration of geiger counters. In order to simplify the reading of the counters, a scaling circuit was set up which divided the number of clicks by two, up to 64.

Housed in the storage space were 24 flight sets; in an ice box were 40 balloons. For the inflation of balloons on windy days, a huge tent was taken along.

Complete facilities were to be had for supplying 110 volts from a gasoline engine generator or from a main line source. Art McCoubrey of Ricketts house constructed a good deal of the laboratory.

Ten flights were made altogether, four at Acapulco and the others at Victoria and Valles.

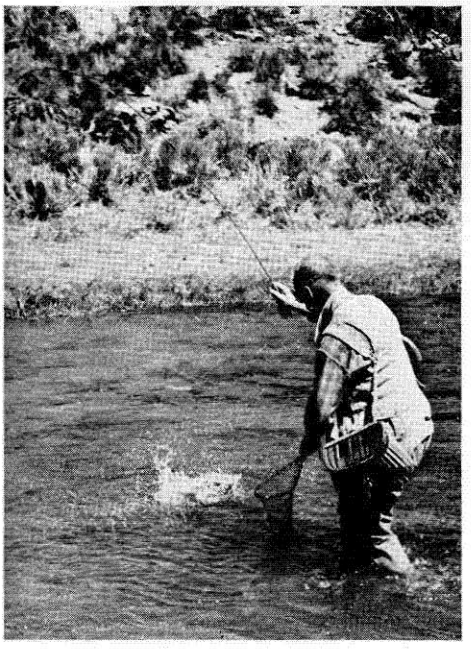
The scientists, journeying through the jungles, observed the lack of curiosity of the natives in what they were doing. Further aiding the men was the characteristic hospitality of the Mexicans. The Meteorological service of Mexico was very cooperative.

Similar trips have carried the investigators to India, the Hudson Bay region, a high-altitude lake in Peru, North Dakota, and Oklahoma. Readings have also been taken from ships all over the world. Their next venture: It is to be in the City of Pasadena. Although the date has not yet been organized, in the opinion of Dr. Pickering, "it looks pretty good."

FIFTH ANNUAL ALUMNI SEMINAR

Donald P. MacFarlane, Chairman of the 1942 Alumni Seminar Board, has announced that in spite of the war activity, the generous cooperation of already heavily burdened members of the Institute staff has made possible the preparation of an interesting and timely program for the 1942 Seminar. As announced in the January Alumni Review, the program has been limited to one day, Sunday, April 12th.

Program announcements, reservation forms, and guest invitation cards are being mailed to alumni, who are reminded that return of the reservation forms by April 6th will greatly aid the committees in completing arrangements for the Seminar. Alumni who do not receive reservation forms may secure reservations by addressing the Alumni Association Secretary at the Institute. As in the past, members of the Association may invite two male guests to whom they should give their invitation cards, signed by themselves for identification of their guests.



Professor W. W. Michael hooks a big one. He will tell how it is done with slides and pictures at the Alumni Seminar lecture at 11:00 a.m., April 12.

As registration will be quicker and easier for those whose dues are paid in advance, alumni not now members of the Association are urged to become members before April 12th. However, for those who fail to pay their dues prior to that date, the Association office will be open to receive payments on the day of the Seminar. It should be noted that those who have not paid their 1941-42 dues may become members for the remainder of this period at the reduced rate of one dollar when this payment is accompanied by $2.50 to cover the 1942-43 dues.

Admission to all meetings will be by identification card given to each alumnus and guest when he registers at Registration Headquarters in Throop Hall. Registration will begin at 8:30 on the day of the program and the fee will be fifty cents per person. Although registration will be simplified for those who have secured reservations in advance, those who have not done so may register upon presentation of membership cards or other evidence of paid-up membership. Each guest must present a guest invitation card signed by his host when applying for registration.

It is important that all alumni and guests visit Registration Headquarters before attempting to attend any of the meetings, regardless of whether or not the registration fee has been paid in advance. Information regarding possible last-minute changes in locations and times of the meetings will be available and lunch tickets may be obtained at Headquarters.

The Seminar program will open at 9:30 with Chapel Exercises arranged by Paul Ackerman, Secretary of the Tech Y.M.C.A. Dr. Eugene C. Blake of the Pasadena Presbyterian Church will be the guest speaker.

At 10 o'clock alumni and their guests will divide into two groups, one to hear Prof. R. W. Sorensen discuss "New Conceptions of Energy Flow in Electrical Circuits", the other to hear Prof. G. R. MacMinn tell of "Walt Whitman and American Democracy".

At 11 o'clock the more technically inclined may hear Dr. Carl Niemann or Dr. J. B. Koepfli on "Poison Gases and How to Combat Them", while those interested in angling may be instructed and entertained by Prof. W. W. Michael who will discuss the "Science of Fishing". Professor Michael will illustrate and explain his points with the aid of slides and motion pictures.

Lunch will be served at 12:10 in the student houses for those who purchase tickets at Registration Headquarters. The charge for these tickets will be $.75 each

At 1:30 those interested in defense against bombs may attend talks by Prof. R. R. Martel and Harald Omsted on "Protection from Aerial Bombardment."

(Continued on page 24)

Mr. Omstead gained first-hand knowledge of this subject from the German invasion of Norway which occurred while he was there. The other meeting at 1:30 will be addressed by Prof. R. D. Gray on "The Engineer's Place in the Present Emergency".

At 2:30 those who wish to go further into the problems of engineers in war work, particularly with regard to what action they themselves should take to more greatly aid in the war effort may attend a seminar conducted by Prof. Gray with the assistance of Prof. Robert L. Daugherty, Prof. Phillip S. Fogg, and Mr. Trevor Gardner. Also at 2:30 another group may hear an historian's interpretation of present events by attending Dr. J. E. Wallace Sterling's talk on "The War in Review and in Prospect".

Alumni will be pleased to learn that, in spite of his many pressing duties, Dr. R. A. Millikan has consented to appear briefly before the closing session at 3:30.

Further information is contained in the Seminar announcements being mailed. Remember, return the reservation forms by April 6th and if you haven't yet paid your dues, take advantage of the reduced rate for the remainder of the year so that you may attend the Seminar.

EMERGENCY PROTECTION PROVIDED

Following the Pearl Harbor attack December 7th, the faculty set up and appointed a Faculty Committee for Emergency Protection which serves to implement emergency protection activities provided by the students. Four students, in conjunction with Prof. W. W. Michael, chairman, Dr. J. B. Koepfli, Mr. E. C. Barrett, Dr. Hardin Craig, Mr. Wesley Hertenstein, and Prof. J. P. Buwalda, and Mr. Joseph Manildi form the Committee for Emergency Protection.

The students have been organized into six groups, each headed by a Warden. Fire, first-aid, information, blackout, utilities protection and gas decontamination are the six divisions of student protection activity, involving nearly 300 undergraduates in all.

The City of Pasadena, through the Civilian Defense Council, requested that Caltech be responsible for providing gas decontamination for the entire city. A series of ten lectures on war gases was given to some 90 students who are now prepared to identify and decontaminate all known war gases likely to be encountered should a gas attack occur. Nearly 50 students have attended a series of first-aid lectures and have been provided with first-aid equipment.

84 METEOROLOGISTS GRADUATE

Eighty-four men, trained to help win the war with more perfect weather forecasts, received their diplomas on February 14th. The commencement was unique in that it was the second defense graduation held on the campus during the current academic year. More than thirty of the graduates who studied as United States Army Air Corps cadets were commissioned as second lieutenants. Major Frank E. Benedict, commander of the U. S. Army Air Corps training detachment, and a former Pasadenan, commissioned the cadets.

Dr. Millikan addressed the graduates of Caltech's special national defense meteorology course, men from Army, Navy, Weather Bureau, and civilian life. To the entire class some of whom may have been wondering about the question, "What about after the war?" Dr. Millikan declared that he could not answer that question. Undiscouraged by the prospects, Dr. Millikan declared that there is no use to speculate on what is going to happen to men, to governments, to economics after the war. Though not much is yet known about the post-war period, Dr. Millikan mentioned that people know what they must do now, and that this class was a demonstration of that fact.

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The scientist traced the history of meteorology back to the ancient Greek times. He spoke of the new importance of these "weather-wise" men, especially in connection with aviation.

Professor Franklin Thomas, chairman of the division of civil and mechanical engineering aeronautic and meteorology, delivered the opening address. Dr. Irving P. Krick, associate professor of meteorology, presented the diplomas, including completion certificates in a practical course of meteorology, certificates of meteorology and degrees of science. Among those receiving degrees of science was Capt. Medardo Gallardo of the Argentine Air Force.

FREE SURVEYING OFFERED

The California Institute of Technology has begun instruction in special tuition-free courses in surveying to help meet an urgent defense need for trained surveyors.

The federal government has announced that national defense requires mapping of the whole Atlantic, Gulf, and Pacific Coasts to a depth of 250 miles inland. This tremendous defense mapping program calls for the employment of 2000 men the first year.

The new courses in plane table topography and surveying instruments and procedure are designed to train men quickly for this important work. Students who satisfactorily complete either course will be in a particularly favorable position to qualify for the post of engineering aid under the Federal Civil Service.

SORENSEN TO DIRECT U. S. RADIO COURSE

Immediate Training for Vital Positions Necessary

A course in elementary radio operation and maintenance is being offered throughout Southern California under the auspices of the U. S. government, with Caltech's Prof. Royal W. Sorensen as regional coordinator. Similar training will be given at many other centers throughout the country under the nationwide program.

The intensive evening classes are to give men and women preliminary instruction which may lead to technicians' positions in industry and furnish the army with men for communications departments.

Immediate training of 20,000 is contemplated, this being about one-fifth of the needed number. Instructors will be drawn from the radio trade and junior colleges. Actual location of the classes have not yet been specified; they will probably be held at convenient locations wherever applicants can be collected.

The course will present everything that the active radio amateur should know, with an accent on mathematics.

DIET EXPERIMENTS HELD AT AIRCRAFT FACTORY

Los Angeles County is conducting an experiment with scientific feeding at the Lockheed Aircraft Factory at Burbank. Under the direction of Dr. Henry Borsook of California Institute of Technology's biology department, dosage of Vitamin A has been given to 1000 persons, who will be checked for results in better health at stated intervals. An ample supply of the vitamin has been assured to conduct the survey, despite the possibility of a rationing plan of Vitamin A to the general public. The source of the vitamin comes mainly from fish liver, and this supply has come chiefly from Norway and Japan in the past.

Dr. Borsook's research in the vitamin field has done much to enlighten social and industrial health workers as to the causes and cures of under-nourishment. The testing of the group at Lockheed will undoubtedly lead to the discovery of further facts in this field.

CALL DOCTOR KRICK TO ACTIVE DUTY

Dr. Irving P. Krick, noted California Institute of Technology meteorologist, has been called to active duty as a United States Naval Reserve officer. His rank is lieutenant, senior grade.

Orders to active duty came in connection with the current expansion of the military meteorological services. His initial assignment is to the Headquarters, Army Air Forces, Joint Weather Central, Washington, D. C. It is expected that he will continue in close contact with Caltech in connection with the Army's greatly expanded weather research project.

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DBNY, STUDENT HOUSE RADIATOR BROADCASTING STATION

An article in the Saturday Evening Post early last spring was the germ of the idea that was to grow into what is now DBNY, Caltech's radiator broadcasting station.

The article told of how the students in some of the eastern colleges had built and operated student broadcasting stations and Gordon Woods, president of Dabney house, seized upon this idea.

Authorization by the faculty was the first step that had to be taken in organizing the station. By the end of March, only a few weeks after the article had appeared in the Post, the faculty committee on students houses had authorized the station and Dr. Clark, the resident associate of Dabney house, had been delegated the responsibility of approving all student house radiator broadcasting stations and the programs to be broadcast. The proposed station was assigned the definite wavelength of 1040 kilocycles and was allowed to broadcast only during the hours of 6 to 6:30 p.m. and 9:30 to 10:30 p.m.

Gordon and Jim Allen got together and by April of last year had their plans fairly well organized for the construction of the station. At least, so they thought. Jim was to build the audio stage of the transmitter and Gordon the radio frequency units. This work was to be done during the summer so that the station would be ready to go on the air the first week of school. Jim Allen upheld his part of the bargain in building and testing the audio stages during the early months of the summer, but Gordon soon found himself in deep waters.

In order to build the transmitter, Gordon sent home for parts of his "ham" outfit in April. It seems that a friend of his had the parts and in the course of events they had become lodged in the attic of his future father-in-law's home. The equipment finally arrived late in the summer when Gordon was working some seventy-two hours a week. The result was obviously — "no transmitter."

In the meantime, it was decided that it would be better to build the whole transmitter at once which was done in two days during the first week of school last September. The result of this plan was that all of Jim Allen's work was scrapped. However, due to the excellent technical ability of Gordon and Jim, the transmitter was built without any trouble and it worked well the first time it was tried.

Since DBNY has been broadcasting, the programs have been given in excellent fashion, with the exception of one or two very amusing incidents. One occured when

Here students operate DBNY for the 5:30 program. The transmitting equipment is coupled to the radiator. DBNY programs come in louder than any local station in any of the students houses. No signal can be heard more than 50 feet away from the buildings.

the phone rang while an announcement was being made. The phone could be clearly heard by those listening, and there was a momentary scramble as everyone attempted to quiet it. Since then, very careful precautions have been taken to prevent the recurrence of such an event.

Although DBNY has been in existence a comparatively short time, it has already made great headway. The first organization to realize the value of the radiator broadcasting station was the Caltech Musicale. This organization has taken over Tuesday and Thursday evenings in order that good classical music with interesting comments might be offered to the students in this manner. Hourly programs are broadcast Monday through Thursday at 5:30 p.m.. and at 9:30 p.m. The 5:30 hour is given over to popular music, announcements, and occasional special features, the 9:30 hour being devoted to the presentation of classical music and to brief musical commentaries by students.

Since the beginning of the war, DBNY has become of real service to the students. The station hopes to continue to serve as an information disseminating unit in event of blackouts or other emergencies. The staff has already pledged itself to keep the station on the air during such emergencies, rebroadcasting programs from the east and giving special news bulletins.

STUDENT BODY PROFITS TO PURCHASE DEFENSE BONDS

At the last meeting of the student body board of directors it was unanimously voted to invest the major portion of the student-body profits for the year to the purchase of $200.00 in defense bonds.

ALUMNI SEMINAR

ALUMNUS CAPTURED JAP RADIO

On February 8th the United Press listening post picked up a message broadcast by the Tokyo radio from five men of the United States Marine Corps who are being held prisoners in Japan. Included was a message from *Lieut. Jack William Schwartz* '35, to his wife, Jennie, of 409 Cloverdale Ave., Los Angeles: "Dearest darling Jennie:

"I know you must all be worried about me but I am safe and in good health so please do not worry any more. I am in a camp in Southern Japan and we are being treated better than you and I thought. I lost a little weight at first but have not been sick and do not expect to be. I hope that the allotment went through so that you have enough money to get along on. The food we get is adequate but if there is any way for you to send me anything I would like some books, candies and canned meats. All our possessions are in Guam except your picture and Penelope's, which I brought with me. As I can send only one message, I know you will tell mother I am well. When the war is over and we are together again we will get a new start together and I am sure that it will be as wonderful as the first. I hope all of you keep well and happy. Incidentally, I did not get seasick on the trip to Japan. I love you, darling, and hope it will not be too long until I see you again.

Your loving, Jack."

NEW YORK ALUMNI MEET

The New York Alumni held a banquet at the Biltmore, New York, on January 30th. Professor Sorensen spoke to the group on the subject "Engineering Horizons, Limited". The members and their wives present included:

R. G. Ager, W. Gordon Abraham, R. W. Ahwenmaker, R. A. Axline, Ethel Billington, Cliff Burton, Max Bower, Harry and Melba St. Clair, Chester F. Carlson, Elsa Carlson, R. S. Custer, Mr. and Mrs. J. A. Davis, Walter B. Fisk, L. L. Ferguson, Fred J. Groat, Peg Groat, Mr. and Mrs. Howard Griest, Donald L. Holland, Morton Holland, Mr. and Mrs. George T. Harnes, Mr. and Mrs. Wm. V. Houston, A. E. Harrison, Claude D. Hayward, A. E. Harrison, Wm. B. Hebenstreet, Sydney B. Ingram, Charles A. Imsurgia, Evan Johnson, Mason A. Logan, W. A. Lewis, George E. Moore, Jule McMahon, Mr. and Mrs. H. E. Mendenhall, Gladys Moulton, Frederic H. Moore, John M. Pierce, Mr. and Mrs. G. Wilber Read, L. E. Swedlund, Mr. and Mrs. E. F. Thayer, Mr. and Mrs. Holley Wolfe.

SOCCER RETURNS TO C. I. T.

Harking back to the days when Caltech athletes found the sport attractive enough to journey to the Pasadena Athletic Club, soccer has once again come into its own. First organized last year under the enthusiastic backing of Al Landau, UCLA transfer student and formerly of Austria, soccer is now a recognized minor sport, drawing record attendances in Tournament Park.

Acting as coach for the 1940-41 season, Laundau took the green but willing squad to UCLA where they chalked up a 2-1 victory against the more experienced Bruins. Impressed by the spirit and success shown in the previous season, the ASB this year recognized soccer as a minor sport, and at the end of football season there was a turnout of 30 men for the varsity squad and 15 for the frosh.

During the past season nine games were played: San Bernardino J. C. was beaten twice, 2-1 and 4-0; UCLA, stung by last year's defeat, managed a 5-7 victory after a terrific battle. After the game the Uclans were lavish in their praise of the Beaver team, both as players and as sportsmen. Unable to find additional collegiate competition, the team began playing in the Los Angeles Soccer League where they found stiff and experienced competition; nevertheless they showed themselves quite capable of holding their own, winning over the Magyars and Vikings and losing to the Vikings and Clan Cameron.

The hi-lites of the year were two games with the RAF, the first of which proved the turning point for soccer at Tech. Although defeated 1-8 in their first game, the Beavers found the game of inestimable value in the lessons of style and technique which it offered. Watching the game was Mr. Liddell, a Scotsman whose interest was immediately aroused by the potentialities shown by the Caltech team. Mr. Liddel offered his services as coach, was heartily accepted, and forthwith introduced soccer, British style, to Caltech, pointing to the smooth and flashy RAF team as a model of excellence. The result was the most memorable game of the season, the second with the RAF squad. Demonstrating the remarkable progress made under Liddell ,the team was able to hold the British visitors scoreless for three-quarters of the game, only to have two goals scored in the final part of the game by the final thrusts of the more experienced RAF players. After the game the victors complimented the Tech team on its great improvement.

The relentless propoganda of Coach Landau in organizing the soccer team was such as to leave a lasting impression on all. Nor did this propoganda cease after organization had been successful, but was continued throughout the season, and every game was announced on signs and posters from one side of the campus to the other. Also organized were small teas after the RAF games to make the British boys perfectly at home. (Conspicuous at these teas wath the Scotch brogue of Tech player Ivor Macpherson Grant, a Canadian, who recently joined the RAF.) To close the season a soccer banquet was held, followed by a dance in Throop lounge.

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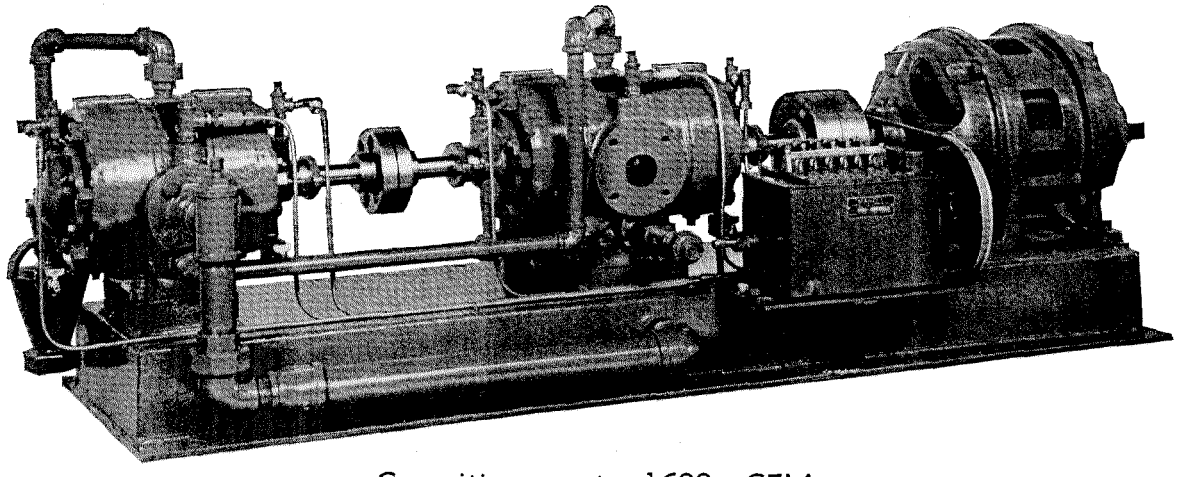

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