WOMEN ENGINEERS AND ARCHITECTS

EDITOR, ALICE C. GOFF, 153 LAUDERDALE AVE., YOUNGSTOWN, OHIO

(MARCH, 1938)

We have received many interesting letters from women engineers and architects in regard to their work.

Miss Mary Virginia Sink of 67 E. Golden Gate, Detroit, Michigan, received a degree in chemical engineering from the University of Colorado in 1936. We learned from the College of Engineering that she was awarded many outstanding prizes for her college record, and that she received her degree with special honors.

Since graduation, Miss Sink has been employed by the Chrysler Corporation as a research chemical engineer. The first year she was given short research problems that could be done in the chemical laboratory. At present she is working on a new project, much bigger than anything she has tackled previously. It entails investigation and research on odors encountered in air-conditioning systems. This division of air-conditioning has received little scientific notice from the "artificial weather" industries, so the Chrysler investigations may well be pioneering efforts. However, the future alone will determine such possibilities.

Chrysler Corporation has a post-graduate and under-graduate school which is incorporated under a charter of the State of Michigan. It is known as the Chrysler Institute of Engineering and is open only to Chrysler employees. The post-graduate school chooses its students from graduates of the various colleges and universities of the United States and Canada. Miss Sink is the first woman student engineer to be chosen. Due to "inconveniences" of having a female member in the laboratory courses, she was not allowed to take the classes. Although this prevents her from getting a master's degree in mechanical engineering in two years, as is customary for the student engineers, it does not prevent the Institute from offering her a master's degree in science, when she has completed the necessary hours of individual study.

For over a year Miss Sink has been teaching chemistry in the undergraduate school, and is the only woman member of the faculty. The students are men of all ages who have the ambition to work nights for their education. Miss Sink finds this work very interesting, and sees many living examples of unquenchable determination -- determination that knows no age limit.

Miss Ann W. Koichline, a registered architect at Bellefonte, Pennsylvania received a degree in architecture from Cornell University after one year at Pennsylvania State College in mechanical engineering. After graduation, she was associated with a Philadelphia

concern. She located at Bellefonte, Pennsylvania, and held the distinction of being the first woman architect registered in Pennsylvania. During the war, she served as a special secret service agent in the Military Intelligence. After the war, she returned to her practice.

Miss Keichline is especially interested in research work for new building materials, such as wall units, roofing, and plaster. She has been very successful in designing and developing kitchen equipment, bathroom fixtures, space and labor-saving devices. She does a general architectural service in planning and construction.

We shall outline briefly a comprehensive article on "Modern Wall Construction" by Miss Keichline. It was printed in the June 1932 issue of The Clay Worker. The purpose of her paper, with its wide scope, is to show that more scientific ideas may be applied to the building of walls by using tried materials, at less cost, without diverging from methods that have been so expressive of the craftmanship of our localities. In introducing her subject, the author stated that the present definite, extensive transition period in architecture is causing changes in materials, and methods of construction, but most notably in the form of the building and omission of decorative features. It is advisable to consider the ultimate effects of the trend; to decide whether such radical changes are necessary and whether they will add to our craftmanship and culture.

Miss Keichline said that if we would be modern, we should seek materials that bring the highest development i n functioning of buildings. Heretofore we have thought of shelter as something reasonably durable but not always fireproof. Now, in considering wall construction, we should select durable material, entirely fireproof, and of high insulating value. It should afford the required strength, and should lend itself to sound-proofing and reinforcing. It should be damp-proof, and of such expansion properties that it can readily meet climatic changes. It should lend itself to the architectural treatment of the building; it should have unquestioned merit in its appearance as to texture and color; and it should show economy.

Inherent in burned clay in the form of brick or tile are found many of these properties, the author stated. Scientific methods of manufacture have made it suitable for all our climates, and chemically it is adapted to all our different atmospheres --- from the salt air of seaboard towns to the smoky air of industrial centers. Undoubtedly burned clay is durable, fireproof, and to some extent damp-proof. To make the wall damp-proof it is necessary to fur out the interior, but this reduces its fireproofing value. Brickwork may be reinforced, and it has fairly good sound-proofing properties. Brick of itself has probably the best insulating value of any of the fireproof wall materials. Ordinary brick walls pro-

vide an excess of compressive strength. Common brick has been developed to carry 4,000 to 5,000 pounds per square inch, but the lowest brick in a five-story apartment house receives a load of only 100 pounds per square inch. In high buildings, the steel framework carries the load.

This survey of the characteristics of burned clay in its adaptability to wall construction leads to consideration as to how we can further its adaptability to the functioning of the building. Well within its required factor of safety a clay unit may be designed, with the required width for rigidity, to use one-half of the clay now used, as there are voids within the finished wall. The unit consists of two face blocks connected by a double web. Many interesting surfaces may be developed from the wide assortment of color tones. One unit has the weight of a common brick, but lays up in volume equal to two bricks. Such units require less time to lay, less mortar and plaster, than for ordinary brick work. The unit may be broken to give a 2x4 face. The interior surfaces of these face blocks may be painted with asphalt to eliminate infiltration, thus damp-proofing the wall. This wall has an advantage over the present form of veneer wall, not only in fireproofing, but also in eliminating the difference in expansion between wood and brick. In tornado and flood districts, or where for any reasons reinforced walls are required, the void on the interior of the wall may be filled at determined intervals with concrete and reinforcing. Crushing strength tests at Pennsylvania State College subjected the unit described to destructive loading. The unit failed under a load of 200,000 pounds, which is equivalent to 3,300 pounds per square inch of gross area or 6,906 pounds per square inch of load-bearing area. The interior open area of the wall may be filled with insulating material, with the result that the wall has several times the insulating value of a solid brick wall. Heat transmission tests made of the special unit showed the following results: At seventy degrees, the insulated wall unit had 54% of the conductance of the uninsulated; and 66% of the transmittance of the uninsulated.

A decided advantage resulting from the use of the special units is 50% reduction in weight of the wall. This not only reduces the cost of the wall, but also produces great saving in the supporting framework and foundations. Still more important advantages result from the well-insulated wall. It reduces the fire hazard to the minimum, for it allows electric heating to be adopted, and made economically efficient. With this type of heating the atmosphere could be more readily controlled. With the building well insulated the amount of air to be conditioned, as well as warmed, would be materially reduced. Good insulation affords the means by which we may have the most scientific method in the mechanical equipping of our buildings.

153 Lauderdale Ave.,
Youngstown, Ohio,
March 1, 1938.

My dear Mrs. Merrill:-

I appreciated your gracious letter, and your interest in my venture. After our former correspondence, I was especially glad to hear further news from you. I am sure you are much too modest as to your present accomplishments.

The response to my bulletin has been sufficient to warrant publishing the newspaper. You will find the first number enclosed. I hope you find it worth while.

I am anxious to include the work of the three original organizers together in one of the early issues of the newspaper. It would be especially fitting, since you, Mrs. Edgecomb, and Miss Quick, worked so hard in the effort to organize. Therefore I would appreciate it greatly if you would forward the story of your professional experience at your earliest convenience.

Sincerely yours,

Alice C. Goff.

WOMEN ENGINEERS AND ARCHITECTS
EDITOR, ALICE C. GOFF, 153 LAUDERDALE AVE., YOUNGSTOWN, OHIO
(JUNE, 1938)

Mrs. Nora Stanton Barney was graduated from the College of Engineering at Cornell University with a degree in civil engineering. She is a registered architect in the State of Connecticut; and the only woman registered as a professional engineer in the State of Connecticut. She maintains an office at 700 Steamboat Road, Greenwich, Connecticut.

For many years Mrs. Barney has been engaged in the designing and building of residences and apartments, but mostly residences. She buys tracts of land, and develops them with roads, lakes, bridges, and houses. She builds these houses either on speculation or to order. They range in price from twenty-five thousand to one hundred thirty-five thousand dollars. The latter is the largest she has sold as yet.

Mrs. Barney is the granddaughter of Mrs. Elizabeth Cady Stanton, the noted feminist pioneer. Naturally she is a strong feminist also. Mrs. Barney has three children and a grandchild.

Miss Lucile Kaufman is director of the Denver Junior Consultation Center of the National Youth Administration at 1545 Tremont Place, Denver, Colorado. Although she is no longer directly engaged in engineering work, she finds her industrial background of inestimable value in a counseling program.

Miss Kaufman received the degree of B.S. in Mechanical Engineering from the University of Colorado in 1927. She was the first woman mechanical engineer in Colorado. After her graduation she was employed by the Westinghouse Company. She was a graduate student in works management at the turbine plant in Philadelphia. Later she was responsible for organizing and installing a cost system for the Beardsler and Piper Company in Chicago. She then became shop planning engineer for the Western Electric Company of Chicago.

In 1937 Miss Kaufman was granted her master's degree by the University of Colorado. Her thesis was entitled "An Experiment in a Guidance Technique." An article of hers appeared in the Journal of Abnormal and Social Psychology for December, 1937.

The Junior Consultation Center is one of the outstanding social service authorities now at work in Denver. It is financed by the National Youth Administration and the W.P.A. Adult Education Program. Miss Kaufman has her headquarters in Room 201 of the Y. W. C. A. building, where she has the assistance of three adult workers and ten part-time youth workers. The large reception room,

testing room, work room, and three private offices, are provided by the Y. W. C. A. The advisory committee is composed of some of Denver's leading citizens.

In speaking of her work Miss Kaufman said, "The counseling service begins with the youth's major problem, which is different in each individual case. The youth is helped to analyze his interests and to know his abilities. This center provides the only job qualification and aptitude-testing clinic in Denver. The next step in the counseling program is to formulate a plan based upon knowledge obtained through analysis, tests and investigation of background and making use of the most complete occupational information file in Denver, as well as records of local opportunities for employment, training and recreation. The services of the center have been requested by the following organizations who then assisted the youth to carry out the plans made: Juvenile Court, Big Brothers, Y.W.C.A., Schools including the Universities, Federated Churches, Catholic Charities, Central Jewish Aid, State Employment Service for Juniors, Police Court, Colorado General Hospital, and the Boys Home. But with all these requests, which is a pretty good coverage of groups in Denver, our records show that twenty-two percent of the boys whose cases we handle come through other boys who have been assisted in our center. This, of course, shows that we pull with the youth, and is very gratifying to us."

The folder of the Denver Junior Consultation Center advertises the fact that it is a free agency which offers guidance and counseling to all young people in their occupational, educational, or recreational problems. Consultation service is intended to: discuss with them their school background and work history in relation to possible employment or training; discover through tests the special aptitudes and skills they have which may be useful in certain occupations; analyze their likes, dislikes, aims, ambitions, and interests; plan with them a satisfactory program related to their background, training, ambitions, and take into account the opportunities open to them in various fields.

Miss Kaufman uses at the Consultation Center the standard tests for aptitude for a certain job as well as several she devised. For example, in testing aptitude for typing, factory work, or any job that requires finger skill, if anyone can put the wooden circlets into the proper holes four times in 233 seconds, he can hold a job. In an art judgment test, the young people are asked to select pictures. Although the Denver Center is one of five such N.Y.A. consultation centers in the nation, the service for youth which Miss Kaufman has developed for Denver has made its name throughout the country. Requests for information about her course have come from all sections of the United States. To comply with all these requests, Miss Kaufman has authored a forty-three page book.

We shall give two illustrations of the value of vocational guidance. The first is a girl who had trained herself for teaching. She is a college graduate in home economics. After teaching one year, she found herself jobless. She realized that teaching was not what she wanted to do. At the Consultation Center it was discovered that she showed greater aptitude for management of a lunchroom. She was located in that capacity, and is much happier and more successful in her work. The second example is a girl who had been hard of hearing for many years. Through tests, Miss Kaufman discovered in her a talent for creative writing. This talent had never been detected before, because the girl only half heard her lessons at school. Earphones were obtained for her through the rehabilitation department of the State. Miss Kaufman was so impressed by her talent that she personally loaned her money for a course at the university.

Miss Jane H. Rider obtained the degree of B.S. in Civil Engineering from the University of Arizona in 1911; and later received a professional degree in the same subject. She is a member of the American Society of Civil Engineers, and the American Association of Engineers. She is registered as a professional engineer in the line of sanitary engineering in the State of Arizona. For many years she was director of the Arizona State Chemical and Biological Laboratory. In 1935 she resigned to become state director of the National Youth Administration in Arizona, with headquarters at 722 Heard Building, Phoenix, Arizona.

Miss Catherine B. Heller received a degree in architecture from the University of Michigan in 1923. She taught at the Art Institute in Chicago. In 1928 she went to New York City to work in interior architecture and interior decorating. She designed the interior of Macy's store, as well as merchandise, such as wall paper and rugs, for Macy's. At the same time she taught some classes at Cooper Union and at the Newark School of Fine and Industrial Art. Miss Heller still conducts these classes in interior decorating.

For professional purposes Miss Heller uses the name of Orlo Heller. She is located at the Bortic Studio, 64 West Ninth Street, New York City. Her specialty is industrial designing, which she finds very fascinating because it involves third dimensional architecture in miniature. Her work also includes shop design and display. She designed displays for Jenter Displays for the year of 1934; and has done several shops. One of her shops was illustrated in the American Architect for December, 1937. It is called the Southern Highlanders. Her design for the Hotchkiss Aristocrat Stapling Machine won first award in the November Modern Plastics Competition; and made it possible for her to enlarge her scope to include objects in plastics. As a result of the publicity she received from this little machine, she styled the leather goods of the Stationers Specialty Company, and did some designing for Molla, Incorporated, in wrought iron furniture.

WOMEN ENGINEERS AND ARCHITECTS

EDITOR, ALICE C. GOFF, 153 LAUDERDALE AVE., YOUNGSTOWN, OHIO

(DECEMBER, 1938)

We are indebted to "The Woman Engineer" of London, England, for the material in this number. The quarterly magazine is "The Organ of The Women's Engineering Society, incorporated 1920". Miss Caroline Haslett, C. B. E., is Hon. Secretary.

We quote from a speech given at the annual conference in September, 1937, in regard to women aeronautical engineers.

"In the sphere of design and construction, the research work of Miss D. Mona Hirst, M.A., A.F.R.Ae.S., in the study o f aerodynamics, deserves special mention; and Miss S. McGuffie and Miss Lyon are now doing most useful work on the Royal Aeronautical Establishment at Farnborough".

"Miss Dorothy Spicer holds ground engineering licenses in all four main categories (A, inspection of aircraft before flight; B, inspection of aircraft after overhaul; C, inspection of aero-engines before flight; D, inspection of aero-engines after overhaul). She is the only woman in the country to be so qualified. Recently she contributed to Popular Flying a most helpful and instructive article for aspiring women aeronautical engineers. She has read to the Conference a paper on 'Selection and Treatment of Steels for Aero-Engines'."

"Miss Pauline Gower has read a paper on 'Ice Formation on Aircraft in Flight'. Miss Gower is herself a distinguished aviator holding pilot's 'B' license, wireless operator's license, and second class air navigator's license".

"There are, all told, 203 women at present holding pilots' 'A' licenses (to fly non-commercial aircraft), 6 women holding pilots' 'B' licenses (to fly commercial aircraft), and 6 holding ground engineers' licenses".

We quote some parts of Miss Dorothy Spicer's paper on "Selection and Treatment of Steels for Aero-Engines".

"The methods of selection and inspection have become extremely meticulous since the smallest irregularity or defect may be the predisposing cause of failure in the finished part. A method of procedure has been developed whereby all steels used for major components, such as crankshafts, master and articulating rods and airscrew shafts, are purchased and allocated in the ingot stage, after an agreed method of examination and selection. From the last ingot of each cast, a five percent discard is removed from

the bottom and a transverse section is then cut across the ingot. This is divided into four equal parts by two cuts at right angles, and two of these quarters are hammered into 1-1/8" dia. bars. One is examined by the steel-makers and the other by the purchasers. This inspection consists of a chemical analysis, physical test after standard heat treatment, and examination under the microscope of an agreed number of sections for cleanliness and uniformity. It may be imagined that the steel-makers looked with misgivings on such a rigorous method of selection but the effect on the quality of steel is surprising".

"The choice of the material for a particular part has to take into account strength for weight, reliability and suitability for the method by which the required shape is reached. For reliability, complete freedom from defects is required and to a certain extent ductility with freedom from brittleness. Ductility is needed, more or less, according to the duty of the part and its liability to suffer from deformation, stress or shock, other than normal, steady duty, during service".

Further on, Miss Spicer stated that the casting of ingots has become more of a science since much research work has been done in the method of freezing; and that it has taken many years of understanding of the complex solution of liquid steel to obtain a homogeneous metal.

We quote directly: "Much advance has been made, of recent years, in the method of hot working, forging and rolling, which are performed at the ranges of temperature in which the steel best lends itself to deformation. Advantage is now taken of the effect of forging upon the layout of the structure, so that any residual non-metallic inclusions will be along and not across the direction of the maximum stress".

"Heat treatment has also reached a very high standard owing to the valuable research which has been carried out recently in that direction. By exact pyrometric control of the electric furnaces, temperature can be regulated to the nearest degree. Thus the results received from the physical test after heat treatment are extremely satisfactory".

In discussing what materials are in use for construction of aero-engines, Miss Spicer compared the properties of plain carbon case-hardening steel with nickel case-hardening steel and the newer nickel-chrome steel. She stated that the nickel-chrome steel had become increasingly popular during the past few years, for it has given a wonderful performance in the manufacture of parts, such as gears. Miss Spicer said that the alloy steels have developed an entirely new technique in case-hardening practice.

Again we quote:

"Another valuable steel which has very important work in the aero-engine comes under the British Standards specification S.81 and is most generally used for crankshafts. This is a nickel-chrome steel which contains a carbon content of 0.28 to 0.35%, nickel 3.0 to 3.75% and 0.5 to 1.3% of chromium, with the opportunity of adding vanadium, molybdenum or tungsten at the steel-makers' discretion, and although higher figures are obtained, the specification calls for an ultimate stress of 65 to 75 tons per square inch, with an Izod value of not less than 35 ft./lbs".

"Another valuable steel which has developed during the last few years is covered by Specification S.65 of which the essential constituents are Carbon 0.28%, nickel 2.75%, chromium 1.0 to 1.4%, molybdenum 0.65% and vanadium 0.25%. This steel is mostly used for connecting rods and on this particular steel much research with regard to casting has been carried out. So successful has the result of the research been that it is possible to get this steel to produce the astonishing figures of 75 to 80 tons per square inch for the maximum stress and an Izod value of 60 to 70 ft./lbs. without the slightest trace of temper-brittleness".

"The development of the stainless steels has been very rapid these last fifteen years. There was a time when it was impossible to produce any sort of cold-drawn high-tensile stainless material since cold working would reduce the corrosion resisting properties well below the performance demanded for marine atmosphere and the difficulties experienced due to weld decay were very great. There are now steels which come under the 18/2 and 18/8 type and show remarkable results in service. For general purposes, these two steels are chiefly used for inlet valves and highly stressed forgings".

"The process of surface hardening certain classes of steel by penetrating the surface with nitrogen has been in commercial use for some years. This new discovery has brought into being certain new types of materials, the most worthy of mention being D.T.D. 87 and 288. The former covers the range of nitriding steels originally developed by Dr. Fry of Germany and the latter the British nickel-chrome-molybdenum steel introduced as a competitor. The second steel can be treated with nitrogen at low temperatures which, although the hardness falls short of the original nitriding steels, is at least comparable with the standard case-hardening steels. The advantage is that the low temperature permits small parts, which are not so liable to distortion, to be finished to exact dimensions and necessitates no further work, except for the slight cleaning up before service".

"Aero-engines have come into being which are able to develop an enormous horsepower and to run at very high speeds. With these

arose the difficulties of detonation, so the use of tetra-ethyl lead was introduced into fuels to increase their anti-knock value. But the effect of this on the exhaust valves was devastating due to the deteriorating effect of the combination of hydrobromic acid, lead bromide, and water vapour. Through much ingenuity these troubles were overcome and the modern aero-engine valve is capable of not only meeting all the present day requirements but allows a considerable margin for further development. The steels in use are austenitic and contain either 14% or 27% of nickel, 14% of chromium and 3% of tungsten. They retain their physical properties at high temperatures and are extremely resistant to scaling. Further improvements have been effected by stelliting the seats of the valves made from these steels, nitriding the stems and partly filling them with metallic sodium to ensure that the valve heads run cool. Although this method of production is, of necessity, costly, the outlook upon internal combustion engines has been modified for the poppet valve is no longer regarded as a limiting factor".

"In conjunction with this development has been the introduction into aero-engine construction of steels with a controlled coefficient of expansion. Two steels containing fairly high percentages of nickel, chromium and manganese are on the market, which with a coefficient of expansion almost identical with that of aluminum, have proved invaluable for such parts as cylinder head bolts, studs, liners and valve seatings, counteracting the vast changes in volume which take place while the engine is running. Where smaller changes give rise to difficulties, they can be guarded against by the use of austenitic steels".

In a later issue of "The Woman Engineer", we noted that Miss Dorothy Spicer has joined the staff of the Air Registration Board.

In her paper on "Ice Formation On Aircraft In Flight", Miss Pauline Gower said that there are three types of ice formation on aircraft: clear or glaze; rime, which is white and opaque; and frost, which is of lighter crystalline formation. She observed that clear ice generally forms in convection clouds, while rime usually occurs in clouds formed by mixing.

We quote from her article several excerpts:

"The boundary line between advancing cold air and a mass of warm air, under which the cold air pushes like a wedge, is known as a cold front. Along a cold front and also along the crest of mountain barriers rapid vertical convection occurs due to the lifting effect of the wedge of cold air".

"When the conditions of a cold front are present thunderstorms (cumulonimbus) are the identifying cloud type and in the case of mountain barriers nimbo-stratus and heavy cumulous. The intense

up-currents in these clouds sustain large drops, and therefore, directly sub-freezing temperatures are reached heavy icing can occur. The boundary line between warm air and a mass of colder air over which it rises is known as the warm front".

"Warm front clouds, which are slower in formation and are due to gradual lifting, also contain large drops. Whenever these clouds are encountered at sub-freezing temperatures it is reasonable to expect clear ice, but rime will form if the cloud density is low".

"When ice forms, it does so along the leading edges - the front edge of the aeroplane's wings, tail-plane and rudder. Now these leading edges have been scientifically constructed so that their shape, calculated to the fraction of an inch, meets the resistance of the air in such a way as to give as much 'lift' as possible to the 'plane. As soon as this shape is altered in any way, as it is by the presence of ice distorting it from the normal, this 'lift' is interfered with, and the aeroplane's progress is endangered. Moreover, the weight of the ice is considerable and if the machine is already fully loaded the additional weight presents a grave peril".

"In winter if a depression is approaching in advance of the warm front, the cold air is below freezing point. There will be a shallow layer of cloud where the temperatures are slightly above freezing point in the relatively warm air which is climbing over the cold air. Any rain falling from these clouds will become supercooled during its passage through the cold air below the cloud and the surface of an aircraft flying in this cold air will be at a temperature lower than freezing point; therefore, any drops of super-cooled water striking the aeroplane will freeze immediately and cause a dangerous deposit of hard, clear ice".

"Except in thunderstorms of marked intensity, generally in winter vertical convection rapidly diminishes at heights above 10,000 feet and, therefore, the size of drops and the cloud density will also diminish quickly. Also, at these levels the temperature is far below freezing point and rime ice will be the general form. It would be safer to say 'Fly high'".

"A climb from a stratum of cold air through a warmer dense cloud demands great caution since the cold surface of an aircraft will hasten the formation of ice. On entering such a cloud every drop that is encountered will freeze almost immediately a n d before many minutes the 'plane will be loaded with ice. If the machine is climbed at the maximum rate permissible, it might be possible to reach the inversion above the cloud before the ice has formed to a dangerous degree".

"One fact that should always be borne in mind is, that ice will evaporate in clear air at sub-freezing temperatures. Ice can

generally be removed by evaporation in the clear air above or below cloud. This very 'cure' does, however, bring with it a possible further danger where the path of flight is chosen below the cloud. Should precipitation in the form of rain occur from the cloud above, the result will be an increased and rapid formation of ice on the 'plane. Snow, however, in clear air, does not form ice at sub-freezing temperatures".

Miss Gower said that three methods had been used to circumvent these natural forces which oppose man's supremacy in the air. The first method of prevention is mechanical; for leading edges are covered with rubber tubing, that can be inflated from the pilot's cockpit to crack the ice. The second method of prevention is chemical; for leather on the leading edges is treated with some chemical to lower the freezing point of water. The third method is by heating, but has been found impracticable.

WOMEN ENGINEERS AND ARCHITECTS

EDITOR, ALICE C. GOFF, 153 LAUDERDALE AVE., YOUNGSTOWN, OHIO

(February, 1939)

Dr. Lillian Moller Gilbreth, a well known industrial engineer, is President of Gilbreth, Inc., Consulting Engineers. She resides at 68 Eagle Rock Way, Montclair, New Jersey.

Dr. Gilbreth is author of several books, including "Psychology of Management", "Homemaker and Her Job", "Living With Our Children". She was co-author of many more books, with her late husband. Some of these are entitled "Fatigue Study", "Motion Study for the Handicapped", and "Applied Motion Study".

The University of California, Brown University, the University of Michigan, Rutgers College, and Russell Sage College, have conferred a total of eight degrees upon Dr. Gilbreth. She has been Professor of Management at Purdue University and lecturer at Bryn Mawr College.

Dr. Gilbreth is a member of the American Society of Mechanical Engineers. She is an honorary member of many scientific societies in the United States and various European countries.

She has traveled extensively, in giving lectures. In 1936 she was selected by American Women as one of ten outstanding women of the United States.

Dr. Gilbreth is the mother of twelve children, eleven of whom are living. The management of eleven growing youngsters required organization. In rearing the children, Dr. Gilbreth applied many of the same principles that she had worked out for the management of big business concerns.

Miss M. Elsa Gardner is editor of Technical Data Digest, U. S. Army Air Corps, Wright Field, Dayton, Ohio. In connection with her work, she reads approximately two hundred magazines a month, in search of material to be condensed for her own semi-monthly publication. Many of these magazines are published in foreign languages, so she is required to translate the articles into English.

Miss Gardner is one of the few women aeronautical engineers in the United States. She is the only woman member of the Dayton Engineers Club; and is one of eight active women members belonging to the American Society of Mechanical Engineers. For many years Miss Gardner has been on the council of the British Women's Engineering Society.

She resides at The Loretto, 125 West First Street, Dayton, Ohio.

During the World War, Miss Gardner received her degree from St. Lawrence College with a major in mathematics and minors in vari-

M+M Meyer

WOMEN ENGINEERS AND ARCHITECTS
EDITOR, ALICE C. GOFF, 153 LAUDERDALE AVE., YOUNGSTOWN, OHIO
(JULY, 1938)

Mrs. Edith Chartkoff Meyer received the degree of B.S. in Metallurgical Engineering from the Massachusetts Institute of Technology. After graduation she carried on metallurgical research at the laboratories of the National Lamp Works of the General Electric Company at Cleveland, Ohio. She published papers on tungsten and iron tungsten alloys which are distinguished. In 1928 she was granted the degree of M.S. in Metallurgical Engineering by Case School of Applied Science, after one year of graduate study.

After her marriage to Mr. Andrew Meyer she resided in South America and Spain, and later worked for the Soviet government in Kazakstan, in Central Asia. There she developed and equipped a plant for smelting lead that resulted in one of the most efficient operations of this nature in the world. Her friends report that she returns from her sojourns with enthusiasm and the most fascinating stories as widely different as Roman remains of mining operations in Spain or the organization and protection of workers in dangerous plant operations under the Soviet regime.

Inasmuch as Mrs. Meyer has worked out of the United States during the past nine years, it is known among a limited few that more gold metal has passed through her two hands than those of any other woman, with the possible exception of the woman who is Director of the U. S. Mint.

At present Mrs. Meyer is residing in Senneterre, Province of Quebec, Canada. Her husband, a mining engineer, is engaged in work for the Bruell Gold Mine Syndicate, Ltd. Mrs. Meyer is occupied this year with her ten months' old son. After she gets him along on his firmer health, she will again take an active interest in metal recoveries.

In 1936 Mr. and Mrs. Meyer collaborated in writing a series of articles for the Engineering and Mining Journal. These appeared in the June, July, September, and October numbers. They were entitled "The Metalliferous Altai of Soviet Russia". The authors were given as Andrew Meyer, Mining Engineer; Edith Meyer, Metallurgical Engineer.

We shall quote some excerpts from those articles:

"The Altai Mountains contain perhaps the oldest working mines within the huge territory of the Soviet Union. The Altai mines are certainly among the richest in the world".

"About seventy-five different mines have operated in this region in the past, producing silver, gold, copper, tin and lead. Some of these mines are operating today and others are in a state of conservation. This article is mainly concerned with those mines which come within the system of the Altai Polymetal Combine, a subsidiary of the Non-Ferrous Trust of the U.S.S.R., and presents a brief history and general geology of the entire Altai mining region and a description of the mining, milling, and metallurgical practices of today".

"The Altai Mountains straddle the boundary line between the People's Republic of Mongolia and the U.S.S.R. The territory discussed in this article is the southwestern section of the Altai Mountains and is inclosed by north latitudes 49 to 52 deg. and east longitudes 80 to 85 deg. All of the area is in the Irtysh watershed near its headwaters. The Irtysh is the greatest tributary of the Ob River and is one of the important waterways of the Soviet Union. It finds its source in Lake Zaisan near the Mongolian border".

"Transportation in this region is afforded by the Ridder-Rubtzovska railroad, which connects with the main trunk line of the Turkestan-Siberian railroad. From the beginning of May to the middle of October, river steamers and barges ply the river, and recently airplane service for mail and passengers was instituted".

"The climate is similar to that of the Black Hills of South Dakota. The mountains are covered with forests, in which there is much game. In the spring, myriads of flowers of every size and hue carpet the floor of the Altai valleys".

"All of the mines now operating in the Altais are on ancient Chud workings. The Chuds were a little-known race, but some believe them to be of Aryan origin and others claim that they belonged to the Mongolian stock. They used bronze tools, and this fact testifies to their developed metallurgical skill. Their mines were well timbered and their workings reached a depth of a hundred feet. They worked the oxidized zones for tin, copper, gold and silver. For some unknown reason the mines were abandoned, caved in, and were overgrown by the forest in the course of centuries".

The authors give an interesting account of the history of the Altais from 1717, when two Tomsk prospectors reported the old workings. Akinfi Demidov sent workers to the Altais, where they found copper, but he cruelly exploited these serfs. In 1727 copper smelters were built. The Altai mines became the property of the Tzar's Cabinet in 1747. Exploring parties penetrated the mountains and reopened many of the ancient Chud workings from 1784 to 1797; so that mining became widespread at the end of the eighteenth century. Liberation of the Rus-

sian serfs in 1862 proved to be the deathblow to the Cabinet-operated mines. Mining steadily declined. The mines became flooded and were not drained until they were recently opened under Soviet management.

We quote directly part of the article in regard to geology:

"For the sake of convenience,Soviet geologists divide the territory of the Altai Mountains into Greater and Metalliferous Altai. Greater Altai is understood to be that part of the Altai Mountains which is in the territory of the U.S.S.R. and Metalliferous Altai is used to designate only that part where metalliferous mineral deposits are known to exist, which covers an area of 40,000 square kilometers".

"The territory of the Greater Altai is covered by greatly diversified rocks; sedimentary, intrusive, eruptive and metamorphosed. The oldest rocks, Cambro-Silurian, are represented by metamorphosed series such as chloritized and epidotized argillaceous slates and tuffs".

"In the Metalliferous Altai there are islands of metamorphosed rocks forming the cores of anticlines and covered over by Middle Devonian deposits. This fact suggests that the rocks composing the Metalliferous Altai are a part of the foundation upon which the younger Devonian and Carboniferous sediments of the Greater Altai are resting".

"The Metalliferous Altai is mainly composed of intensely folded and metamorphosed Cambrian and Silurian rocks along sharply defined tectonic lines. Younger deposits played a lesser role and subsequent tectonic forces merely intensified the already existing deformations and metamorphoses".

"Several orogenetic movements contributed to the building up of the mountains of the Metalliferous Altai. The presence of Lower Paleozoic in the northwest definitely establishes two tectonic phases, one having taken place between the Lower and Upper Silurian, as in the Charish River Basin, and the other in the Lower Devonian, which caused the northeastern section to be elevated".

"Because of the metamorphosed character of much of the sedimentary rocks of the Altai, fossils are not frequently encountered. However, there are certain characteristic fossils, such as the trilobites, which are found in the valley of the Charish in a bed of sandy slates of Lower Silurian a thousand meters thick. Separated from these slates by conglomerates is a series of Upper Silurian sediments made up of argillaceous slates with graptolites and limestone with Tabulata and brachiopods. Middle Devonian deposits are

indicated by the presence of 'Spirifer chicheli' in calcareous clayey slates in Southern Altai. In this same area evidence of the Upper Devonian is lacking - no fossils have been found".

"At the end of the Paleozoic came a period of igneous activity. At first batholiths of granite were formed; then followed intrusions of quartz keratophyres. As the older rocks were interwoven with sills of diorite and granodiorite, they offered great resistance to folding, and the overlying strata were crushed and fissured rather than folded. Very long fissures were developed, some of them reaching a length of 500 kilometers. Thus the intrusives followed not only the folds but also the fissures of the crushed zones. It is probable that the great Kalba batholith, which runs parallel with the Irtysh tectonic line, acted as a buffer toward the Devonian and Carboniferous rocks of the Metalliferous Altai, saving them from intense folding. In Kalba even the Upper Paleozoic deposits are standing upright".

"From an economic standpoint, the most important tectonic phase is the one which occurred at the end of the Paleozoic, for with it are connected the intrusions of quartz keratophyres which carried the mineralizing solutions. Altai ore deposits belong between the Peruvian and Upper Carboniferous".

The writers show that the varied ore deposits of the Metalliferous Altai are in genetic connection with the igneous intrusions found in the territory. They further state:

"The Altai polymetal deposits are mesothermal in character, having been deposited by circulating hydrothermal waters. They contain zinc, lead, copper, cadmium, iron, gold and silver, and a number of rare elements in small quantities, such as vanadium, arsenic, tellurium, bismuth, titanium and gallium. Distribution of the metals in the ore varies in the different deposits. The minerals usually occurring are galena, sphalerite, chalcocite, chalcopyrite, tetrahedrite, and pyrite, and infrequently arsenopyrite and pyrrhotite are found. Very rarely the tellurides hessite and altaite occur, as in the Savodinsk mine. Gold is found in three forms: free, and often in coarse nuggets; alloyed with silver, electrum; and as telluride. The gangue minerals are quartz, barite, carbonates, sericite and chlorite".

"In the different deposits various minerals are found which give indications as to the temperatures at which the several deposits were formed. Thus at Sekisovsk, where the deposit is believed to be epithermal, kaolinite predominates, but there is some alunite as well. Tellurium compounds of lead and silver were found in the Zavodinsk mine and in the Talovsk mine. Such high-temperature minerals were found as pyrrhotite, cubanite, hematite, and magnetite".

The authors give a detailed description of ore deposits in the Zmeinogorsk group; the Belousovsk and Zyrianovsk mines; and the Rid-

der group. They describe mining operations and equipment used in the four mines operating at present. Amongst other things, they say of the Ridder group: "This group, the most important producer today of lead and zinc not only in the Altai but in the entire Soviet Union, is situated at the foot of the Ivanov Range near the source of the Ulba River. A number of very incompletely explored polymetal deposits are found, of which only the Ridder and Sokolny mines are producing ore today. About 70 percent of all the known reserves of zinc in the Altai is at Ridder, and this corresponds to 30 percent of the zinc reserves of the entire Soviet Union. For lead reserves 80 percent and thirty-five percent are the corresponding figures".

"One should note that in 1933 the known ore reserves for both Ridder and Sokolny were 14,978,530 metric tons, whereas, at the end of 1935, as a result of the many disclosures from diamond drilling, the combined ore reserves for Ridder and Sokolny were estimated at 31,633,530 metric tons, out of which about five million tons is available for immediate exploitation".

"In the region of the Altai Mountains, metallurgical interest is confined at present to three places: Ridder, where there is a concentrator handling about 1,000 tons of ore daily, a lead smelter and refinery, a small electrolytic plant producing cadmium, a small sulphuric acid plant, and accessory apparatus; Zyrianovsk, where a mill is handling about 250 tons of ore daily; and third, Belousovsk, where there is a pilot mill. Ridder is, of course, the most important of the three as a producer".

The writers show that milling facilities for treating complex ores are increasing. The procedure in the Ridder mill is shown in the flowsheet, tables, and reproductions of photographs, as well as by description. We find it too long and involved to quote here. However,we must mention some unusual problems which the authors had to solve. The Ridder mill has to take everything which the mine produces without bedding bins or other means of mixing the ores. As there is great variation in the types of ore, obviously o n days when the material sent to the mill is mostly impregnated rock or slaty ore, the mill analyses will not be the same as when rich sulphide ore is sent to the mill. The authors had two remedies for this situation. Secondly a serious incident occurs each winter. With the coming of prolonged cold weather the lubrication throughout the mill freezes up and gives especial difficulty in the fine grinding section. Lead concentrates and concentrates from the tables in the gold section are run in box cars to the smelter.There are no storage bins, so the delivery is often irregular, subject to the weather. Finally, in the Zyrianovsk mill there is the distinct problem of recovering the precious metals from the large quantity of wood chips which come from the mine, and get thrown out of the circuit from the ball mills. Under the authors' suggestion this problem was successfully solved.

We shall quote a part of the description of the Ridder smelter:

"The charge, sent to the roasters from these bins, is shoveled into the small cars. The concentrate - frozen or otherwise, and containing limestone, iron ore and quartz ore - is sent to a small Blake crusher, which crushes to 10 to 20 millimeters. This material is passed via bucket elevator to a disintegrator. The charge runs approximately 1.5 to 1.75 cars of concentrate, 0.75 cars of iron ore, and 0.5 cars of quartz ore".

"The crushed material runs on a belt conveyor from the disintegrator to the hopper directly over the roasting machines. From the hopper it drops down onto a mixing table, where water is added as found necessary by the hand-squeezing test, and from there fed to the pallets of the roasting machine, being spread out by a mechanical arm. Roasting is done in two stages, and the partly finished material which comes off the first machine is carried up in a skip to the feed hopper on the second roasting machine, where the roasting is done and the material more or less agglomerated. A third roaster operates alongside of the No. 2 machine and handles all the fines from No. 2 machine mixed with some fresh material from No. 1 machine. Two roasters are kept in reserve. The final product of the No. 2 and No. 3 machines passes into a small bunker, from which it is drawn at will into the small overhead monorail cars and carried to the charging floor of the blast furnaces".

The authors describe the continuation of the process in the blast furnaces, and later in the lead refinery. They picture changes made under their supervision. Prior to December, 1934, the refined lead was of low grade, with too much antimony and precious metals left in the lead. This was corrected, so high quality refined lead could be produced as desired. Under their guidance, precious metals were recovered, and a general technical control was set up throughout the smelter.

The writers foresee an ambitious future for the Altai polymetal deposits as the young Russian engineers acquire more practical experience. Two sore spots in the program, power and transportation, have been appreciably eased, and thus facilitated further development of the region. The plan for the future of the Altai includes 6,550 metric tons daily mill capacity and 118,000 metric tons annual smelting capacity in 1942.

It is interesting to note in this article that Russian women as well as men are employed as metallurgists in the electrolytic department at Ridder.

WOMEN ENGINEERS AND ARCHITECTS

EDITOR, ALICE C. GOFF, 153 LAUDERDALE AVE., YOUNGSTOWN, OHIO

(March, 1939)

Miss Lillian M. Scott of 1014 North Astor Street, Milwaukee, Wisconsin, is employed in an architect's office at Milwaukee.

Miss Scott received her degree in architecture from the University of Michigan in 1936.

Miss Marie Luhring is an engineer with the International-Plainfield Motor Company at Plainfield, New Jersey.

Miss Henrietta C. Dozier is a registered architect in the State of Florida. She has offices at 415 Peninsular Life Building, Jacksonville, Florida, where she conducts a general practice in architecture, landscape design, and interior decoration.

After serving a short apprenticeship in an architect's office, which served to give direction to her subsequent studies, Miss Dozier studied at Pratt Institute in Brooklyn, N. Y. for two years. Then she spent four years at the Massachusetts Institute of Technology, from which institution she was graduated in 1899 with the degree of Bachelor of the Science of Architecture.

Her first thirteen and a half years of practice were spent at Atlanta, Georgia. Since 1914, she has lived and practiced a t Jacksonville, Florida. Most of her work has consisted of apartments and residences, although she has done designs for churches and commercial buildings.

From 1905 to 1929 Miss Dozier was a member of the American Institute of Architects. The depression caused her to terminate her membership in that organization.

Although still in active practice, Miss Dozier plans to retire soon. Against that time, she has built up an interest in genealogy by assisting in compiling two books, and is now writing the Dozier Genealogy.

Miss Rose Rabinowitz entered the College of Engineering of the University of Alabama in the fall of 1935 as a freshman in the course in aeronautical engineering. She has pursued this course steadily and is now a senior. Miss Rabinowitz was born in Greensboro, North Carolina but is now a resident of Philadelphia, Pa. She was elected Secretary of the student chapter of the Institute of Aeronautical Sciences last fall. She may be addressed at University of Alabama, University, Alabama.

Miss Marie Maurer received her degree in electrical engineering from Cornell University in 1922. She is now Mrs. L. Walton Richardson of 110 Seeley St., Scotia, New York. She has given up professional work, because her family occupies her time.

Mrs. Hannah Champlin Scott is a landscape architect with an independent practice in Cleveland, Ohio. She may be addressed at 4500 Euclid Ave. Mrs. Scott is a member of the American Society of Landscape Architects. She received her B.A. degree from the University of Michigan in 1919; and her Master of Landscape Design degree in 1921.

Dr. Frances H. Clark is a metallurgical engineer with the Western Union Telegraph Company at New York City. She is a member of the American Institute of Mining and Metallurgical Engineers. Her address is 60 Hudson Street, New York City.

In 1921 Dr. Clark received a degree from Syracuse University. The Massachusetts Institute of Technology conferred the degrees of M.S. and Sc.D. upon her in 1922 and 1926, respectively.

Our publication has completed its first year. We shall be glad to hear whether you wish to renew your subscription at a dollar a year. We are anxious to obtain new readers, so that we may obtain variety in reading material. If you send two new subscriptions with your renewal, we shall mail the three for two dollars a year.

WOMEN ENGINEERS AND ARCHITECTS

EDITOR, ALICE C. GOFF, 153 LAUDERDALE AVE., YOUNGSTOWN, OHIO
(February, 1941)

Miss Ida Annah Ryan is a registered architect in Florida. Her address is 834 Kenilworth Terrace, Orlando, Florida.

In 1905 and 1906 Miss Ryan received degrees from the Massachusetts Institute of Technology. For ten years she was assistant in the building department of Waltham, Massachusetts. She was partner in the firm of Ryan and Luscomb at Waltham for five years.

During the First World War, Miss Ryan was with the War Department, in the drafting room of the gun carriage section.

She was designing architect for F. H. Trimble at Orlando for two years. Since 1922 she has been a partner in the firm of Ryan and Roberts.

Among the buildings designed by Miss Ryan are the Presbyterian Church, Library, and Tourist Club at St. Cloud, Florida; the City Park Band Stand and Unitarian Church at Orlando, Florida.

Lady Lindsay, wife of the retired British Ambassador to the United States, Sir Ronald Lindsay, is American by birth and parentage. Before her marriage to Sir Ronald fifteen years ago, Lady Lindsay was a landscape gardener and architect.

For nine years they resided in Washington, D. C. At the great red brick embassy on Massachusetts Avenue, the gardens gave Lady Lindsay an opportunity to keep up her professional interest. She made them a capital showplace.

Miss Lilian Jeannette Rice is a registered architect in California. She is a member of the American Institute of Architects.

She received a degree from the University of California in 1910. Formerly she was associated with Requa and Jackson, Architects, at San Diego. Miss Rice has practiced independently since 1929. Her address is Rancho Santa Fe, California.

Miss Rice is secretary of the art jury of the Rancho Santa Fe Association.

153 Lauderdale Av.,
Youngstown, Ohio.
March 24, 1942.

Dear Miss Eaves:

Several months have elapsed since I issued one of my bulletins for women engineers. You will find several of the latest ones enclosed.

My work at the Truscon has kept me busy. In addition I spent several weeks in Cleveland, where I worked for a consulting engineer. While there, I designed all the reinforced concrete for a bomber plant to be built in Texas. It has a supported floor, flat slab construction. The foundations were heavy, because the allowable soil pressure is low. The building is to cost about fifteen million dollars, and the equipment about fifteen million more. When I returned to Youngstown, the Truscon had work waiting for me. It is naturally all war work. Then the Cleveland people sent the structural drawings for checking, after they had put my design on the drawings. Altogether it has kept me very busy.

Of the women engineers that I meet here and there, there seem to be no civil engineers. While in Cleveland, I met Mrs. Andrew Meyer, the metallurgist, about whom you read in my paper. She is now doing research work in that city. Some time ago, while I was designing a building for Truscon at Dayton, Ohio, I met Miss Elsa Gardner, aeronautical engineer at Wright Field.

There has been considerable publicity about Elsie MacGill, chief engineer of the Canadian Car & Foundry Co. at Fort William, Ont. They are making large numbers of planes in their factory.

There are now ten women studying engineering at the University of Michigan. Doubtless there are corresponding numbers in other schools.

I have started to collect material for a book about women in engineering, and related sciences. My idea is to devote a chapter to each person. I would like to present them from some human interest angle, and not make it too technical for the general public. I have received some material, but not enough as yet. I had intended to write you to ask if you would consent to be included; and if you are willing, to forward something about yourself. I do not wish the book to seem like a catalog, or other dry statistics. It must have some life if it is to go over.

I hope that the papers will answer any questions that my letter has left unanswered.

Sincerely yours,

Alice C. Goff.

WOMEN ENGINEERS AND ARCHITECTS

EDITOR, ALICE C. GOFF, 153 LAUDERDALE AVE., YOUNGSTOWN, OHIO
(March, 1941)

It is a curious anomaly that war, which women have always bitterly denounced, forced the professional advancement of women engineers and architects. It is true that a few women pioneered in these professions prior to the first World War. But it was during that Great War, when men were not available, that the services of women engineers and architects were in great demand. They were drawn into tool design for 240 mm guns, and into chemical research. They worked at gauging in torpedo plants. They designed buildings and automobiles. Great numbers of positions were open to women to carry on professional work formerly done by men.

After the first World War had brought these women architects and engineers into prominence, and they had demonstrated their ability, other women became interested in these professions. As a result, constantly increasing numbers have enrolled in schools of architecture and engineering in the two decades intervening between the first Great War and the present time. Progressive colleges and universities welcome women as students in these courses. A recent enumeration disclosed the fact that approximately a thousand women are now trained engineers or architects in the United States alone. Many of them have received master's degrees in their chosen subjects. A few have their doctor's degrees. In addition to the women engineers and architects, thers is a large number of women with degrees in sciences very closely related to engineering, such as physics, chemistry, metallurgy and astronomy. Many of these women possess doctorates, and are engaged in important research work.

Some women are registered as professional engineers or architects in most of the states where registration is required. They are members of engineering and architectural societies. They are authors of technical articles in magazines. Some write books.

Nor is the interest shown by women in engineering and architecture confined to the United States. In England, as well as in some other countries, the first World War had a tremendous effect on the progress made by women in these professions. The Women's Engineering Society was incorporated in London in 1920. The magazine of the society, "The Woman Engineer", contained technical articles, and news items regarding women engineers. At the 1933 Century of Progress, held in Chicago, an international exhibition of the work of women in architecture included over one hundred entries from England, Scotland, Sweden, Finland, Czechoslovakia, and France.

We have noted that the first World War affected the status of women engineers and architects considerably. The present World War is bound to affect it further. But of even more interest and importance than the recognition of women's work in these professions,

will be their unusual accomplishments during the present crisis, and their notable contributions to their professions. It is not so much what the professions will do for women, as what women will do for the professions, that is going to matter.

In this connection, let us observe what some women are doing now.

Under the headline, "Training Plane For R.A.F. Is Woman Engineer's Achievement" the Michigan Alumnus presented the following article:

"Elsie Gregory MacGill, M.S.E.'29, was one of those rare individuals in college - a woman studying engineering. Now she has the distinction, not only of being the Chief Aeronautical Engineer of the Canadian Car and Foundry Company, and only woman member of the Engineering Institute of Canada, but of having designed a new training plane for the British Government. Possibly she is the only woman in the British Empire engaged as an aeronautical designing engineer. Born in Vancouver, British Columbia, she comes of a distinguished family, her grandmother having been a prominent Canadian suffragette and her father a barrister, while her mother, now Dr. Helen Gregory MacGill, is Judge of the Juvenile Court at Vancouver. After taking a degree in electrical engineering at the University of Toronto, 1927, (incidentally, as the first girl to receive this degree at Toronto), she came to the University of Michigan to study aeronautics, managing to complete the work despite an attack of illness similar to the dread infantile paralysis, which kept her in a wheel chair for three years. After her recovery, she joined the Fairchield Company at Montreal as an airplane designer, leaving this firm a year and a half ago to take up her present work. She has continued her college studies as well, by taking two years of post-graduate work towards a doctor's degree at the Massachusetts Institute of Technology. Despite her choice of a career, and the fact that 'Maple Leaf Trainer' which she designed and building of which she has directed, is for military training purposes, Miss MacGill is in other respects completely feminine, being fond of cooking, sewing, clothes, parties, bridge and other pursuits dear to the hearts of her sex".

The daily press had photos of "Heroines of Air Who Help Britain's Fight For Life". The English women pilots from the women's section of the air transport auxiliary doing invaluable work in flying completed fighting and bombing planes from factories to the Royal Air Force airports. Miss Pauline Gpwer, officer commanding the corps of twenty-five crack English women pilots, is a member of the Women's Engineering Society in London. At its annual conference four years ago, she presented a most comprehensive paper on "Ice Formation On Aircraft In Flight". We quoted excerpts from that paper in a previous bulletin.

In the rotogravure section of the paper we found a picture of Eleanor Platt operating a crane. "She Swings It. - Wholesomely attractive, Eleanor Platt looks as if she just stepped off a campus, between classes. But she's more at home 'mid the clatter o f heavy industry than in a cloistered classroom. Here she's at the throttle of the 10-ton crane she operates eight hours a day, six days a week, in the plant of the Bullard Machine Tool Co., at Bridgeport, Conn".

WOMEN ENGINEERS AND ARCHITECTS

EDITOR, ALICE C. GOFF, 153 LAUDERDALE AVE., YOUNGSTOWN, OHIO
(April, 1941)

For the past two years Miss Ruth Elizabeth Morris has been architect with Gascoigne and Associates, Consulting Sanitary Engineers of Cleveland, Ohio. On December 2, 1939, she married Francis D. Young, also associated with Gascoigne's. They reside at Hotel Westlake, Cleveland, Ohio. Miss Morris, as she is known professionally, was recently elected to membership in the American Society of Civil Engineers.

The Highway Traveler magazine gives a description of the new Pennsylvania Turnpike, extending for 160 miles between Harrisburg and Pittsburgh. It has been termed the greatest bit of road engineering in the world. We quote a portion of the article:

"One of the contractors was Miss Margaret McNally, a pretty blonde miss from Saginaw, Michigan, who grew up with roads. Her father is the famous Tom McNally, 25 years a road builder.

"She was graduated from the University of Michigan as a civil engineer and once underbid her father on a job. With borrowed equipment, she finished the job, and made money. Since then, she has been in with her father, and along the turnpike she's known as the female boss.

"She doesn't look the part. She wears sheer hose and two-tone shoes, lacy shirt-waists and pleated skirts doing her work as an engineer and supervisor.

"She built 20 miles of 12-foot runways, or five miles of four lanes. Quite a job for a woman, especially under specifications which called for nine inches of reinforced concrete and shale shoulders, not to mention perfect soil in the medial strip -- where flowers from all over the nation will be grown.

"The daughter's first job was to figure costs, and they say she is a whiz at this. Then, when the bid was accepted she personally handled the job.

"For months on end, she kept a payroll of $15,000 a week. But she told us at dinner one night, 'I didn't have much trouble...I think it is because men don't have as much backbone as women'.

"Her strip of the road had the woman's touch, too. When the road was finished, they sifted soil and brought it to the turnpike for the medial strip. Then, they'd spread this out on the surfaced road, to take out with rakes scraps of roots and weeds and so on".

Miss Mary Jane Clarke, first co-ed to complete the course in mechanical engineering at the University of Wisconsin, was graduated with honors last June. She worked with men students in all required shop and laboratory courses; was honored by Pi Tau Sigma, honorary engineering fraternity; and was named a member of the Society of Automotive Engineers. She accepted a position with a manufacturing firm in Rochester, N. Y.

Delight Sweney, who is Mrs. John B. Trimble, is the only woman in the country who is doing the work of a regular architect with the Federal Housing Administration. She has been with FHA since its inception.

The book, "Planting Design", by Florence Robinson, Assistant Professor of Landscape Architecture at the University of Illinois was recently published by McGraw-Hill Book Co., and was advertised thus:

"In this book the author approaches the subject of planting design as does the painter who endeavors to please the eye by his grouping and arrangement of color and texture.

"Of special value to the home owner who is doing his own planning, in whole or in part, are the practical discussions of soils and the plant lists based on ecology or natural plant associations and for special conditions, such as dry ridges, ravines, proximity of running water or of stagnant water.

"This book shows how to use color vigorously and daringly twelve months in a year; how to match texture of buildings with the type of planting; how to adapt the right lines and silhouettes i n plants to suit the building; and the important part played by soil and climate in the choice of plants".