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3900101934 62(07)  
pam 620.0071141

PRICE 4d.

# Facilities for Training Women as Engineers

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THE WOMEN'S ENGINEERING SOCIETY,

46, DOVER STREET, W. 1.

1921.

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<sup>1</sup> Cambridge University, while admitting women to attend the Course of Engineering, does not admit them to take the University's Degrees.

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- BELFAST MUNICIPAL TECHNICAL COLLEGE: F. C. FORTH, F.R.C.Sc.I.
- BOROUGH POLYTECHNIC: C. T. MILLIS, M.I.Mech.E.
- BRADFORD TECHNICAL COLLEGE: H. RICHARDSON, M.Sc. (*Late Beyer Fellow of Manchester University*).
- BRIGHTON TECHNICAL COLLEGE: W. MANSERGH, M.A., D.Sc.
- EDINBURGH, HERIOT WATT COLLEGE: A. P. LAURIE, M.A., D.Sc.
- HALIFAX TECHNICAL COLLEGE: J. CROWTHER, B.Sc.
- HUDDERSFIELD TECHNICAL COLLEGE: J. F. HUDSON, M.A.
- <sup>1</sup> LOUGHBOROUGH COLLEGE: H. SCHOFIELD, M.B.E., B.Sc., A.R.C.Sc., Assoc.M.Inst.C.E.
- MANCHESTER SCHOOL OF TECHNOLOGY: J. C. M. GARNETT, C.B.E., M.A. (*see Manchester University*): *Professor of Mech. Eng.*, GERALD STONEY, F.R.S.
- NORTHAMPTON POLYTECHNIC INSTITUTE, CLERKENWELL: R. M. WALMSLEY, D.Sc.
- ROYAL TECHNICAL COLLEGE, GLASGOW (*Affiliated to the University of Glasgow*): H. F. STOCKDALE, LL.B., F.R.S.E.
- WEST HAM TECHNICAL INSTITUTE: T. C. BAILLIE, M.A., D.Sc.

### GENERAL INFORMATION.

(A) The Degrees obtainable are: Bachelor of Science, Engineering; Master of Science, Engineering; and Doctor of Science, Engineering. Students do not usually specialise in a particular branch of Engineering until their third year.

(B) It may be borne in mind that a Degree in Commerce may be as useful to the woman interested in engineering, as a Degree in Engineering, since posts are subsequently more

<sup>1</sup> This College Course consists of Five Years, arranging for alternate weeks to be spent in the 'shops,' in order to obviate the need for subsequent apprenticeship.

easily obtainable on the Commercial than on the Technical side.

(C) The standard of education generally required by University Authorities includes, or should be up to, Matriculation. Intending Students are not advised to specialise too much. Good mathematics are required; French and German are preferred to Greek and Latin, and an elementary knowledge of economics, including general industrial questions, should be acquired. There should also be some study of chemistry, physics, and applied mechanics, and experience in geometrical and machine drawing is valuable. A very necessary qualification for the would-be engineer, however, is the ability to apply knowledge in a capacity to 'think.'

(D) In regard to the cost of such University Education, the inclusive fees for the degree of B.Sc. in Engineering may be roughly estimated between £100 and £150 for a course of three academic years, with small additional fees for Matriculation and Examination fees. The expenses are of course extended over the three years and are payable in three instalments. A student usually has to spend about another £10 on books and instruments.

Technical school education is considerably less expensive, and a Course in Commerce at a University is less expensive than one in Engineering.

(E) Living costs at a University Women's Hostel vary between £50 and £70 per session, apart from lunches, etc., taken outside. This does not include maintenance during the vacation periods, and also does not include dress allowance or money for amusements.

(F) Students obtain a certain amount of practical experience in the University workshops, and many authorities arrange for them to spend a few weeks in a commercial firm during the long vacation. In addition it is usually considered that a further period of training or pupilage with a firm is advisable, and this is sometimes taken before entering the University, or else after the first year, or after taking a Degree.

(G) An apprenticeship in the usual sense consists of workshop training for five years, in conjunction with continuation classes. (Such apprenticeships start at the age of about sixteen and not much later.)

(H) Where any apprenticeship is obtainable, it is strongly urged that the student shall require to be paid the same *occupational rate* (including time and piece rates) as the male apprentices in the works. This is extremely important, as *it must not be the policy of the Woman Engineer to endeavour*

to undercut the prices of men with whom she may be similarly qualified.

*N.B.*—The Society, while accepting no responsibility for finding employment for qualified engineers or those wishing to become apprenticed, are nevertheless taking every step to ascertain what firms would be willing, under the above conditions, to offer vacancies. Further particulars concerning the details of academic training may be obtained from the Secretary, the Women's Engineering Society, 46, Dover Street, or from the Universities and Colleges concerned.

### SCHOLARSHIPS.

Women are now almost universally recognised as eligible for scholarships on the same terms as men, and intending students are advised to communicate with the authorities of the particular University or College, or to the Secretary of the Society, as such opportunities may very greatly minimise the expense of training, and enable less well-to-do students to obtain a training that they otherwise could not afford. The values of Scholarships vary very considerably, and some are worth as much as £250.

### REMARKS.

1. It is admitted that an engineering career is a strenuous one, but it cannot be considered a more unhealthy occupation than a number of others, or even more dangerous. During her term in the shops, standing for long hours may be found rather trying, but a girl who is ordinarily athletic and healthy generally becomes quickly accustomed to it. Conditions in City offices are often worse in respect to lighting, ventilation, etc., than in the majority of large works, while the risk of accident is no greater than that involved in many sports in which women have proved themselves proficient: such as, motor cycling, yachting, hunting or certain forms of winter sports.

2. Although the industry is not ready at the moment to absorb large numbers of women, those who have the necessary qualifications can usually find work if they will be content to begin in a small way and wait for their promotion.

3. It may be suggested for the interest of the intending student that, in its broadest application the field of engineering is a very wide one, and below are cited some of the branches in which there are pioneer women already engaged.

(1) Electrical Engineering; (already qualified women are admitted to various grades of membership in the Institution of Electrical Engineers).

(2) Civil Engineering, as articled pupil to a Civil

Engineer. For this it is usually necessary for a premium to be paid.

- (3) Research work.
- (4) Draughtsmanship.
- (5) Patent Office work.
- (6) The construction of artificial limbs.
- (7) The mechanical side of X-Ray work.
- (8) Commercial work, Buying, etc.

4. Apart from these considerations however, it is recognised that there are a number of girls, who by reason of their age, or inability to afford a technical education, cannot take up any of the above branches or become an apprentice for the usual five years. A girl of secondary school education, with a good knowledge of shorthand and typing and an added experience of book-keeping, estimating, etc., should be advised to enter an engineering works on the commercial side, and endeavour through keenness, and by the aid of technical evening classes, to get into touch with and gain experience in as many branches as possible. Drawing for advertising and catalogues is another opening for women with mechanical knowledge, combined with artistic perception and literary ability.

On this semi-secretarial and commercial side, a number of women have already held well-paid posts, obtained by work on the lines that have been suggested.

5. In addition to the opportunities for women engineers in this country, it should not be overlooked that they are similarly engaged in the Colonies and other countries, Canada, U.S.A., Switzerland, etc., and before the present upheaval, in Russia also.

6. While endeavour has been made to give the would-be woman engineer some practical information in regard to the openings available, and how best to train for them, this small pamphlet does not in any way set out to be a comprehensive treatise. If any reader can give the Society reliable information of fresh openings for Women Engineers, it will be very gratefully welcomed.

### ENGINEERING INSTITUTIONS ADMITTING WOMEN.

Institution of Civil Engineers.  
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