THE UTILISATION OF CONDEMNED ARMY BOOTS.

THE London Section of the Society of Chemical Industry has recently established what for lack of a better term we must call a club—that is, a society of its members and their friends, who seek to combine a chastened conviviality with an interest in technical chemistry. At a meeting of the club, held on May 21, Mr. M. C. Lamb, by permission of the Director of Army Contracts, brought to the knowledge of the members the various methods that have been suggested in order to utilise the leather in condemned Army boots, and which, in the absence of proper organisation, might lead, when we have regard to the present magnitude of our Army, to an enormous waste of material of considerable intrinsic value, even after it has served its primary purpose as footwear.

Mr. Lamb's paper appears in the issue of the Journal of the society for September 29, and as it affords a good illustration of what may be accomplished by the intelligent co-operation of experts and officials in dealing with a problem of special importance at the present time, a short summary of its contents may be of general interest. War is so terribly wasteful that any efforts to minimise its effects, even if they are only concerned with discarded boots, merit attention and appreciation.

It is not to be supposed that this particular problem has only just arisen. Even in peace-time the worn-out boots of "a contemptible little Army" had to be condemned. They were sold to contractors, who doubtless found means to turn them to more or less profitable account. But with millions of men under arms and in active service, the whole matter had to be dealt with in a very different fashion from that in pre-war periods, and the object of Mr. Lamb's communication was to show the results which have followed from attempts to discover means for the better utilisation of discarded footwear.

It will doubtless surprise many people to learn that waste boot leather has been found to be a good material for road-making, the scrap leather, preferably of soles (since a more profitable use can be found for the uppers), being mixed to the extent of from 5 to 10 per cent., depending upon the character of the road, with slag, granite, or limestone, in conjunction with asphalt and bitumen. It is claimed for this mixed material, which is known as "Broughite," from the name of the patentee, that it possesses the hardness and rigidity of the ordinary tar macadam road, with reduced attrition and dust and greater resilience. The method employed is to mix the scrap leather with the asphalt, bitumen, limestone, etc., lay the surface of the road with the composition, and give a top facing of slag, granite, or limestone. One ton of the tarred material is needed to cover six square yards with an application 4 in. thick, or some 89,000 pairs of discarded boots to each mile of a roadway eight yards wide. It seems a just and fitting retribution—a sort of poetical justice—that boots in their old age should be condemned to make good the roads they have trodden and worn down.

Experience has shown that "Broughite" is a cheap and satisfactory substitute for wood-paving; it possesses greater wearing qualities, and is equally silent; it costs much less than wood and no more than bituminous macadam. It affords a good grip for rubber tyres and an excellent foothold for horses. The Roads Board is making trials of its value, and several pieces of roadway have been laid down under its direction.

Waste leather makes an admirable form of *animal charcoal*. When subjected to destructive distillation leather yields about a fourth of its weight of a comparatively pure charcoal, which has a decolorising power, as tested on sugar syrups and gelatin, in nowise inferior to bone-char. At the same time, the distillation products afford from 23 to 25 per cent. of crude *ammonium sulphate*, suitable as a fertiliser.

The leather of boot uppers contains on an average about 15 per cent. of extractable *grease and fatty matter*, melting at about 38° C., and quite suitable for currying leather, and for other purposes in which a moderately hard low-grade grease suffices. The approximate present value of these products to be obtained from a ton, or 560 pairs, of condemned boots is rather more than 16*l.* 11*s.*, of which the charcoal and ammonium sulphate are by far the more important items.

On account of its nitrogen content leather waste is regarded as possessing considerable potential value as a manure. It, however, decomposes very slowly, and requires special treatment to make it effective. Chrome-tanned material is found to be hurtful to plant-life.

Other uses for condemned military boots are in the manufacture of leather board, leather pulp and powder, clogs, washers for screw-down water-taps, mats, cyanides and prussiates, glue and size.

Evidently, as the time-honoured adage says, "there is nothing like leather," even from old boots.

THE ORGANISATION OF ENGINEERING TRAINING.

A CONFERENCE on the above subject was held at the Institution of Civil Engineers on October 25, delegates representing the chief engineering institutions and educational bodies, various Government departments, and a number of universities and technical colleges being present. Sir Maurice Fitzmaurice, president of the Institution of Civil Engineers, took the chair.

Sir Maurice Fitzmaurice, in opening the proceedings, remarked that there was a great gap between the period when a boy decided to become an engineer and when he actually entered on his training. There was general recognition that youths entering the engineering industry should receive uniformly sound training, and the proposals to be brought before the meeting related to the establishment of a central representative committee to secure better co-ordination in this matter. The council of the Institution of Civil Engineers felt that nothing but good could come of this meeting, in which all interests, educational, professional, and manufacturing, were represented.

A letter was read from Mr. H. A. L. Fisher, the President of the Board of Education, regretting his unavoidable absence from the meeting, and stating that the Board of Education would be glad to co-operate in any well-considered scheme which the engineering industry might adopt.

Mr. A. E. Berriman, one of the honorary organisers of the meeting, then gave a brief account of the origin of the movement, which was also the subject of a memorandum placed in the hands of those present. The proposal to form a central organisation for improvement in and better co-ordination of engineering training originated at an informal conference of engineers and educationists, which held several meetings at the Board of Education during the early months of 1917. It was considered desirable that in its initial stages the proposed organisation should be free from the need of Government finance, while co-operating with the Board of Education and other educational bodies. Mr. Fisher had concurred in this view. The chief objects of the organisation would include:—(1) Co-ordination in engineering training, the fostering of apprenticeship as a national institution, and promo-