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Scientific Slaughtering.

THE problem of the humane slaughtering of animals for food is one which has exercised many members of the medical and veterinary professions. It is of direct concern to men of science, first because certain relevant facts which are in dispute can only be settled by rigorously scientific experiment, and secondly, because the ethical principles involved have received a much enhanced significance from the work of Darwin and other zoologists. The discussion recently opened at King's College, London, by Profs. McCunn and Smythe, of the Royal Veterinary College, under the chairmanship of Prof. Julian Huxley, affords an occasion for putting before the readers of NATURE the more important of the facts relating to the slaughterhouse.

In all matters which involve a conflict between ethical principles and economic interests the relevant facts are apt to become entangled in a good deal of special pleading, and in the present case there are certain points upon which even scientific authorities are not in agreement; but although the necessity for further inquiry of a rigorously scientific character is generally recognised, a number of important facts may be regarded as definitely established. The most recent authoritative documents for these are the reports issued by the London County Council on Feb. 15, 1923, and by the Public Health Department of the Corporation of London on April 2, 1925. Considerable importance attaches also to a paper read by Prof. G. H. Wooldridge before a meeting of the National Veterinary Medical Association and published, together with the discussion which followed it, in the *Veterinary Record* of Mar. 4, 1922; and to a report on the Jewish method of slaughtering by Prof. E. H. Starling and Sir Michael Foster, published by the Admiralty in 1904. The views of the meat traders were defended by Prof. Leonard Hill in the *Lancet* of Dec. 22, 1923, but the results of the demonstration arranged by them at Birmingham in November 1923 should be accepted with considerable reserve, so far, at all events, as the question of bleeding is concerned, since (according to Dr. W. J. Howarth, Medical Officer of Health to the Corporation of London) animals were "left on the floor for different intervals before the blood was allowed to be extracted." This incident emphasises the necessity for ensuring that such trials be controlled in every detail (including, by the way, the selection of the animals) by men trained in the rigour of scientific method.

The old-fashioned methods of slaughtering which are employed in the case of about fourteen million animals yearly in Great Britain are broadly as follows: Large animals before being killed are stunned with a poll-axe; pigs are hoisted with a chain attached to one hind leg and stuck, commonly without previous stunning; many calves and some pigs are first stunned with a hammer; occasionally sheep and lambs are similarly stunned, but usually they are lifted on to a 'crutch' or trestle and stuck with a knife while conscious, after which their necks are broken by pressing back the head, the spinal cord being sometimes cut with the knife; Jewish slaughterers, for reasons of ritual, first throw the animal and then cut its throat in every case. The modern method, which is at present used for about one million animals yearly in Great Britain, consists in preliminary stunning with a specially designed pistol, after which the animal must be immediately bled.

From the humane point of view the superiority of the pistol over the poll-axe has been placed beyond serious question by the experiments conducted on behalf of the Corporation of London by the Medical Officer of Health (Dr. W. J. Howarth), the Superintendent of the Metropolitan Cattle Market (Mr. J. R. Hayhurst), and the Veterinary Surgeon at the Central Meat Market (Lieut.-Col. T. Dunlop Young). These officers found, in a number of trials with careful and experienced slaughtermen, that it took on the average 2.49 blows with the poll-axe to stun a bull, 1.23 blows to stun a steer, 1.27 to stun a cow, and 1.55 to stun a large sow or boar. With careless or less experienced slaughtermen the results would have been still less favourable. On the other hand, with a particular captive-bolt pistol, 542 bovines were stunned with 543 shots and 712 swine were stunned with 715 shots. Starling and Foster found that when the throat is cut with exceptional skill (in the Jewish method) the duration of consciousness, as tested by corneal reflex and by purposiveness of movement, varies from 5 to 40 seconds, with an average in the neighbourhood of 20 seconds. The qualitative superiority of the pistol over the knife, from the humane point of view, may be regarded as established, though there is some difference of opinion as to the quantitative aspect of the matter. However, Sir Arthur Mayo-Robson has described an important post-mortem test which does not appear to have been applied in the investigations under consideration: it consists in examining the meninges. Dr. Pfister, Director of the Zurich Abattoir, has found that when animals have been

stunned before killing their meninges are normal, whereas in animals killed without stunning, as many millions are in Great Britain, the meninges are intensely congested, a fact which proves that suffering has occurred. Finally, the use of the knife has to be learned by practising upon living animals.

The captive-bolt pistol does not involve danger to the slaughterman or to bystanders, and its use calls for only such reasonable care as may fairly be demanded from a tradesman. The meat traders' federation collected for the London County Council inquiry 15 examples of alleged accidents occurring with 'humane killers' between 1913 and 1920, but of these 5 turned out to be cases of suicide and 4 to be otherwise irrelevant. Of 5 genuine and 1 suspectedly genuine accidents, 5 occurred with pistols of the free-bullet as distinct from the captive-bolt type, and in the remaining case the type of pistol was not specified.

There are, however, other considerations which cannot be quite so easily dismissed. The most difficult of these is the allegation that pigs do not bleed so freely when shot as when killed by the old-fashioned methods, and that shot pigs are therefore less valuable for the manufacture of export bacon. It is also alleged that the flesh of shot pigs is more liable to be disfigured by 'blood splash.' The Corporation of London's research negatives the second of these allegations but leaves the first undecided: not only scientific authorities but also those engaged in the trade are divided on the subject, and further trials are called for. Doubtless a great deal depends on the precautions taken to promote bleeding immediately after shooting. In any case, it should be borne in mind that in large factories the pigs, when hoisted, are attached to a travelling conveyer, and owing to the weight of the animal the pressure of the chain on the leg will cause suffering, apart from the use of the knife.

In the case of sheep the difficulty is somewhat different. If a sheep be lifted on to the crutch and then shot, its struggles are said to make manipulation of the pistol more difficult than that of the knife. If, on the other hand, it be shot on the ground, the labour of lifting it on to the crutch afterwards is increased. Thus a 7-handed gang slaughtering 100 sheep a day might need an extra hand, whose wages would possibly amount to 12s. 6d. a day. The increased cost of production would therefore be about 1½d. per sheep, or 0.025 pence per lb. of mutton. Such a small expense should not be allowed to obstruct the

doing of what is clearly just and right ; Switzerland, Holland, Germany, Sweden, and Denmark have set an example which Great Britain could follow.

In the Jewish method of slaughter, which is governed by a traditional ritual, the animal is first cast, after which its throat is cut with exceptional skill and elaborate precautions. From the humane point of view throat-cutting is not so satisfactory as stunning, but the most serious objection to this method is the preliminary casting, which in the opinion of Starling and Foster involves definite cruelty, sometimes of a serious character. The Jews are by nature and tradition a humane race, and it should not be impossible for their experts to devise some modification of the procedure which will satisfy all the requirements of the situation. Indeed, so recently as Mar. 17 an important test was held at Brixton of a new apparatus designed by Mr. H. Weinberg to obviate the cruelty involved in casting. It is understood that a number of veterinary surgeons who were present were satisfied that a great advance has been made, and it is to be hoped that mercenary interests will not prevent Mr. Weinberg's apparatus from receiving a more extensive trial.

The compulsory training and licensing of slaughtermen is a pressing requirement, for while most slaughtermen are fully trained before they use the poll-axe, there is no adequate provision for the enforcement of this elementary precaution against the infliction of unnecessary suffering. But perhaps the most serious defect of our slaughtering system, both on humane and on hygienic grounds, is the lack of adequate control and inspection of slaughterhouses. In the more advanced of the Continental countries, private slaughterhouses have been extensively replaced by public abattoirs, but unfortunately in Great Britain private slaughterhouses still exist, and their licences have a capital value which opposes a strong vested interest to the movement for reform. The financial cost of doing what is right in this case is by no means an inconsiderable one. Obviously, however, the element of fear can be much diminished in a properly designed public abattoir, which also facilitates supervision for humane and hygienic ends. Hence public abattoirs alone are tolerable in towns, while in country districts a rigorous system of inspection and control by public officers is called for. The hardship which would be inflicted on the "slink" trade in meat from tuberculous animals could be softened by a good system of insurance.

It will be seen that while a very substantial body

of facts may be regarded as established in connexion with humane slaughtering, there are other facts—and particularly as regards the effect on the quality of bacon and the psychological element in the suffering of the animals—which call for authoritative investigation. It is essential that the experimental work involved should be carried out by disinterested scientific men, adequately familiar with the canons of scientific method. However, apart from prejudice and conservatism and the professional pride taken by slaughtermen in a highly skilled trade, which they have learned by long apprenticeship, the opposition to reform is based on mercenary considerations. Even if the shot pig should prove to be somewhat less valuable for export bacon than the pig which has been more painfully killed, the question will arise whether the economic motive should prevail over the ethical.

The Ministry of Health proposes two alternative by-laws for adoption by local authorities, but does not enforce their acceptance. By-law 9a requires that all slaughterers except Jews shall stun the animal before killing it, except in the case of sheep. By-law 9b is similar, but it applies also to sheep and specifies the use of a mechanically operated instrument—that is, in practice, a pistol. Out of some 2000 local authorities only 226 (including the London County Council) have hitherto adopted the stricter by-law, though the number is growing in response to propaganda by the Royal Society for the Prevention of Cruelty to Animals, the Humane Slaughter of Animals Association, and other humanitarian bodies. The adoption of the by-law may put a district at an economic disadvantage in its competition with neighbouring districts for the patronage of butchers, many of whom are prejudiced against the pistol. The Sanitary Committee of the Corporation of London has therefore passed a resolution to the effect that the time is now opportune for the issue of definite regulations which should be of general application throughout Great Britain, and that "in order to secure uniformity such regulations should be issued as compulsory regulations by the Ministry of Health." Presumably the Government will hesitate to take the necessary action until it feels itself supported by a well-informed public opinion, but the subject is an unpleasant one, and the public naturally prefers to know as little of it as possible. In the face of this situation, no apology is needed for having brought it to the attention of scientific men, who are *ex hypothesi* opposed to obscurantism.

C. W. HUME.