EDITORIAL.

The Digestion of Milk. Among the chief penalties of civilisation must be reckoned the progressive inability of woman-kind to suckle her offspring. And although medicine may find some means of hindering the loss of function, there is little doubt that for long she will be driven to seek the remedy in improving artificial feeding. Considering, therefore, the enormous importance of accurate information on the composition and digestion of cow's milk, the remarkable investigations now being carried on in America by Van Slyke and Hart ought to be more widely known than at present.

The outstanding fact of practical moment to the physician which emerges from their work is this, that when milk enters the stomach it automatically adjusts itself as regards digestibility to the gastric powers for the time being. In a stomach of feeble digestive capacity, milk is so dealt with as to tax function just to its limit and no more, while in a more active organ the same milk will demand a greater effort before it is digested. Milk, therefore, is the unique possessor among foodstuffs of the property of developing the growing gastric functions. A brief account of the changes it undergoes in digestion will make this clear.

Casein exists in milk as calcium paracasein, which is changed by rennin into a soft clot of calcium paracasein. Hydrochloric acid converts this, first, into free paracasein, and then, when in excess, into paracasein hydrochloride. These three—calcium paracasein, free paracasein, and paracasein hydrochloride—represent three progressive steps in the formation of solid curd, the first being soft and flocculent, the second firmer, and the third the dense, cheesy curd familiar to all. Now, the new-born infant's stomach secretes no hydrochloric acid, and only the soft rennet clot forms in it; this is not digested by pepsin in the absence of acid, but is expelled into the duodenum without further elaboration, the process serving to exercise the feeble motile power of the stomach wall. Later, as small quantities of hydrochloric acid
appear, the soft coagulum is converted into a denser mixture of free paracasein with calcium paracasein, and a certain amount of peptic digestion is demanded. Finally, as the acid becomes abundant, the dense paracasein hydrochloride is produced, and peptic digestion is further stimulated.

This remarkable compensatory process suggests an explanation of the tolerance of healthy infants for pure cow's milk, and of the success attending Budin's method of feeding; it also explains the anomaly that occasionally a baby which cannot digest a weak milk mixture may be able to support a stronger one. For obviously, if the amount of casein be small relatively to the quantity of hydrochloric acid secreted, a dense curd will form, and by increasing the casein a less dense, though more bulky, curd will result. True, we are still in the dark as to any analogous adjustment in intestinal digestion, and further research on this is required. A further striking fact learned is the great solubility of casein in very dilute hydrochloric acid, a solution so weak as 0.002 per cent. having distinct solvent property at the body temperature.

Other of Van Slyke's observations show that our notions of the constitution of milk require modification. It has been proved that woman's milk, like that of the cow, is acid, not alkaline. Hence we must seek a new explanation of the indubitable benefit of adding alkalies in feeding infants. Apparently sodium bicarbonate, lime water, etc., do not merely delay the action of the gastric hydrochloric acid, but combine with casein, and deprive it of its property of being curdled by rennet. Prior to the appearance of hydrochloric acid in the stomach, accordingly, we can, by adding less or more alkali, provide a milk which will undergo little or no primary rennet digestion. The percentage composition of milk, too, seems so variable as to nullify any approach to exactitude in minutely calculated modifications based on an assumed average. For what they are worth, Van Slyke's figures, from 5500 analyses, are—Fat, 3.9; casein, 2.5; albumin, 0.7; sugar, 5.1: on the whole, then, approximating a little more closely to human milk than those usually given. More important, perhaps, is it that the ratio of casein to albumin is only about 3½ to 1, instead of 5 or 6 to 1, as currently stated,—this, too, being nearer the human average.

Valuable and suggestive as this work is, the experimenters themselves are the first to assert that much more must be done before the true nature of milk digestion is known. Without wishing to incur even a suspicion of encouraging rule-of-thumb methods, we venture to say that too much striving to regulate infant feeding on purely theoretical grounds is at present less likely to advance practice than clinical observation and experiment. This is a matter in which every practitioner might help. What we need are series of exactly recorded weight curves of
healthy infants under various conditions, with precise details of
the feeding adopted. After all, we wish to discover the best way
of rearing the normal child. The pediatric physician's experience
of these is necessarily less than of puny dyspeptic or wasted
infants, and not a little of the current teaching on infant feeding
is coloured by this experience.

Dr. Waller, President of the Section of
Physiology, at the recent meeting of the
British Association, devoted the greater part
of his introductory address to the discussion of the best means
of diminishing the dangers attending the administration of chloro-
form. To many the subject may seem somewhat trite and want-
ing in the element of novelty usually looked for upon such an
occasion, but to us his remarks appear to be singularly appropriate
and worthy of the earnest attention of every surgeon, and more
especially of those who are responsible for the education of future
members of the medical profession. It seems to us that the time
is not far distant when the question of the administration of anaesthetics in relation to the responsibility of the medical man
will assume greater prominence.

It is at present too much the custom to attribute death to
unavoidable and accidental causes when a fatality occurs, and for
the administrator to disclaim all responsibility.

Considering the fact that chloroform has now been in common
use for sixty years, and that the uniform experience of physio-
logists is to the effect that it is a dangerous drug as ordinarily
used, it is astonishing that its administration should not rest
upon any definite scientific basis.

In the opinion of Dr. Waller and others who have specially
investigated the subject, there can be little doubt that a consider-
able proportion of the deaths which occur during the adminis-
tration of chloroform are due to an overloading of the blood
with the anaesthetic, or, in other words, are the result of an over-
dose. Two causes are chiefly responsible for this danger. The
imperfect method of regulating the amount of the vapour inhaled,
and inexperience on the part of the administrator. The latter
cause can in part be obviated by more thorough instruction of
the students in the theory and practice of anaesthesia, a point
upon which great stress was laid by some speakers in the dis-
sussion; and as to the former, without desiring to advocate the
use of any special form of apparatus, we would only accentuate
the importance of the drug being administered in such a manner
as to obviate so far as possible a source of danger which must be
regarded as proved by clear and irrefragable evidence.

In regard to the legal bearings of death occurring during the
administration of chloroform, it is no doubt true that before a
EDITORIAL.

196

The charge of malpraxis could be proved against a medical man, it would be necessary to show gross ignorance and carelessness in the conduct of the case; and, so far as we are aware, such a charge has never been sustained against a qualified medical man in this country in connection with a death under anaesthesia.

During recent years, however, the Crown has caused all such deaths to be strictly inquired into, more especially as regards the precautions adopted by medical men prior to and during the administration, the necessity for the employment of a general anaesthetic, and the presence of any condition in the patient which might be considered to contra-indicate the use of such a drug.

This procedure on the part of the authorities indicates that they recognise that a certain responsibility attaches to the medical man concerned. He must be prepared to justify the procedure he has adopted in the event of a fatality. We doubt very much whether the majority of medical men fully appreciate this aspect of the question, and as regards at least one point we are convinced that the subject does not always receive due consideration. We refer to the choice of the anaesthetic to be employed. It cannot now be denied that chloroform anaesthesia is accompanied by a very appreciable risk to life, and this being so, it is, to say the least, ill advised to run this risk if "gas" or chloride of ethyl, or even a local anaesthetic, will serve the purpose.

We have known of deaths taking place during the administration of chloroform for the purpose of pulling a single tooth, and for such a simple operation as opening a whitlow in a healthy adult man.

It is difficult to persuade one's self, and possibly in the future it will be difficult to convince the Crown authorities, that such cases do not indicate a rashness which is unjustifiable, and which might without undue straining be regarded as culpable.

In any event, we believe that the time has come for the whole question of the administration of anaesthetics to receive much more serious consideration than appears to be the case in many of our hospitals and amongst those intrusted with the training of future members of the profession.

The new ordinance which Edinburgh University has been successful in obtaining will have, we believe, a beneficial and far-reaching effect upon medical education in Scotland. The chief change which it introduces is that whereby candidates in the professional examinations (first, second, and third) may enter for examination in a single subject after attending the necessary qualifying course of lectures.

It is provided further that in the final subjects, candidates may appear for examination in forensic medicine and public health at any time after completing their third professional, while
the examination in midwifery may be taken in December of the fifth winter session, and that in medicine and surgery at the end of this winter, thus leaving the last summer free for the clinical examinations.

The academic year will be divided in future into three terms, and at the end of each of these, professional examinations will be held, namely, in December, March, and July. The effect of this will be that students will have three opportunities in the year of being examined in any subject, provided they have conformed to all requirements of the ordinance and of the Faculty; while another effect, and one which, no doubt, will be hailed with satisfaction by the examiners, is that in future the annoying and unsatisfactory system of special examinations will be abolished.

Needless to say, various objections and criticisms have been urged against the ordinance, the chief of these being directed against allowing candidates to enter for examination in a single subject. This clause appears to have been specially objectionable to our sister university of the West, which, without however adducing any arguments, alleged that it tended to lower the prestige of the degrees of the Scottish Universities. This, of course, is nonsense. The whole object of the change is not to lower but to raise the standard of efficiency of the examinations, a fact which was definitely stated so long ago as 1904 at a conference of the Medical Faculties of all the Scottish Universities. The whole trend of reform in medical education has for many years past been in the direction of trying to get rid of the old fetishes in regard to teaching and the conduct of examinations, which have been handed down from the early part of last century.

The cast-iron conservatism of the Scottish Universities has already done enough harm, and it is time that an effort should be made to bring the teaching and system of examinations more into conformity with common sense and the progress of scientific medicine. It is difficult to conceive what good object is achieved by compelling students to pass subjects, which are by no means always cognate, in groups, or in enforcing an interval, sometimes of many months or even a year, between the fulfilment of attendance on the course of instruction and presentation for examination.

Surely the candidate who devotes his attention mainly or entirely to one subject will obtain thereby a much better and more intelligent grasp of it; and, having thus studied it, and shown a proficient knowledge, he should be allowed to devote himself to other subjects without the incubus of a prospective examination hanging over his head. What other object there can be in preventing him going up for examination at this time, except to add a wholly artificial difficulty to the attainment of his degree, we are at a loss to understand. The new ordinance will not make the passing of the professional examinations and the acquisition of the degree easier, except to the extent above indicated, because
one of the chief objects of the change is to secure a higher standard of efficiency, and no student will be able to pass in a single subject unless he obtains "sufficient merit" in the examination, that is to say, unless he fulfils the regulations at present in force in regard to exemption in a single subject of a group.

Two other points have given rise to criticism, namely, the fact that a student may in future pass in physiology before he has completed his course in anatomy. This is an unfortunate necessity, caused chiefly by the difficulty of providing sufficient subjects, so as to ensure that every student has made a complete dissection of the whole body. He can, however, go up for his anatomy examination at the December examination in his third winter, so that the disadvantage referred to is more apparent than real. With another contention that it is wrong to permit midwifery to be dissociated from the examination in medicine and surgery, we have no sympathy—in fact, we regard it as a distinct advantage that the student should be left free to devote the last six months of his curriculum entirely to the two latter great branches of study.

Time alone will prove whether the ordinance fulfils all the hopes that have been set upon it. We have every confidence in the verdict, and believe that the present changes merely represent an instalment of the reforms which are necessary to bring the curriculum into conformity with modern ideas of medical education and the advancement of science.

The Exeter Meeting. There is something quite distinctive in the life of an English cathedral town. The visitor is conscious of a certain impressive dignity, a pervading air of mediaeval scholarship. It seems for the moment as though he had left the stream of progress and entered a charming and restful backwater. Those who visited Exeter on the occasion of the recent meeting of the British Medical Association cannot fail to have been impressed with sentiments such as these. The reception accorded to the Association was of the heartiest, and the fickle weather god, strange to relate, smiled uninterrupted during the week.

Although no announcements of startling discoveries were brought before the sections, the general impression appeared to be that the sectional meetings were quite up to the average standard of interest, and that the subjects chosen for debate had been such as to afford ample opportunity for practical discussion. Dr. Davy, the president, selected as the topic for his address a number of problems concerning physical culture and their relation to the future welfare of the nation. The address in medicine was delivered by Dr. Hale White, who chose as his theme, "A Plea for Accuracy in Medicine." The time that is
wasted in demonstrating the errors of premature conclusions cannot be overestimated. “We shall often have to say that we do not know, but, at any rate, our refusal will not retard, but will rather advance the progress of medicine.” In this sentence the lecturer emphasises a truism, which might with benefit be given to every scientific worker at the outset of his career, and which calls for emphasis from every teacher. Mr. Butler, who delivered the address in surgery, chose as his subject the data in favour of the auto-inoculation of cancer.

Dr. W. J. Mayo. Dr. William J. Mayo, the distinguished American surgeon, has been on a visit to the old country. After spending a few days in Liverpool, he made his headquarters for a time in Edinburgh, and visited the anatomical and other departments of the University and the operating theatres of the different hospitals.

The variations in the shape and position of the stomach provided the subject for an interesting talk with the Professor of Anatomy, while the inspection of the roll-book of the first Monro furnished a tangible link with the past such as rarely fails to appeal to the sentiments of the citizens of the Great Republic.

In the operating theatres Dr. Mayo proved himself an interested and an interesting critic, indulgent also, because it is the surgeon of great experience who is most alive to the difficulties of a case. Like most of his fellow-countrymen, he is an out-and-out adherent of the aseptic as opposed to the antiseptic technique—if these terms are still permissible—and is inclined to condemn absolutely the use of chemical agents of any kind during the actual progress of an operation in clean tissues. He declined to operate himself—in our opinion very wisely—as, although it would have been interesting for those who are unable to visit America to see so distinguished a surgeon at his work, it has come to be recognised that a surgeon should not operate away from his own staff of assistants and his own armamentarium, apart altogether from the fact that he may not have had sufficient opportunity of observing the case upon which it is proposed he should operate.

He was greatly impressed with the Royal Infirmary, and with the fact that so small a town as Edinburgh should possess a hospital provided with 850 beds.

An interesting item in his visit was the signing of the roll-book of the Royal College of Surgeons, of which he was made an Honorary Fellow on the occasion of its fourth centenary two years ago.
Post-Graduate Course. We are glad to learn that the Post-Graduate Vacation Course in Medicine, which is being held this month, promises to be as successful as that held last year. A considerable number of graduates from abroad have already arrived, and most of the classes during the first half of the course are well filled. It is a matter of satisfaction that it has been found possible this year to institute a course on Operative Surgery, conducted by Mr. Alexis Thomson and Mr. Miles. Such a class is especially useful to members of the Public Medical Services, and it is hoped that circumstances will permit of its being repeated not only at the Annual Vacation Course, but also at other periods of the academic year, in conjunction with the continuous scheme of post-graduate instruction which the Committee is endeavouring to inaugurate.

The Royal College of Surgeons have decided to entertain members of the present Course at an “At Home” in the College during the month, so as to afford teachers and graduates an opportunity of inspecting the Museum and of meeting in friendly intercourse.

Dr. Milligan. The death of David Milligan, M.B., C.M., which occurred on the 17th ult., caused deep regret amongst a large number of his professional brethren in Edinburgh. He began the study of medicine comparatively late in life, and graduated in 1883. He settled down in general practice, and his sterling qualities, both as a man and as a physician, soon obtained for him a wide circle of friends and patients. Nearly six months ago he knew that an incurable disease must shortly exact its toll, but he bore his great trial with exemplary fortitude, and when the end came he was residing at Gullane with his family, to whom we desire to express the deep sympathy of a large number of his colleagues.