

Dress and health : an appeal to antiquity and common sense / by Charles Moore Jessop.

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DRESS AND HEALTH:

AN APPEAL TO ANTIQUITY AND
COMMON SENSE,

14.

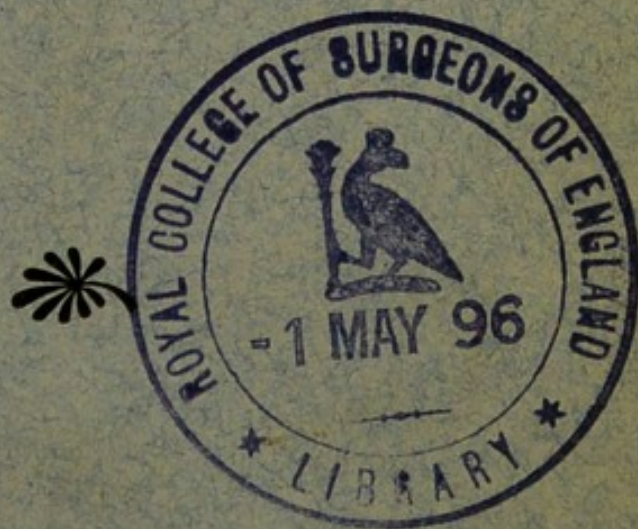
BY

CHARLES MOORE JESSOP, M.R.C.P. LOND.,

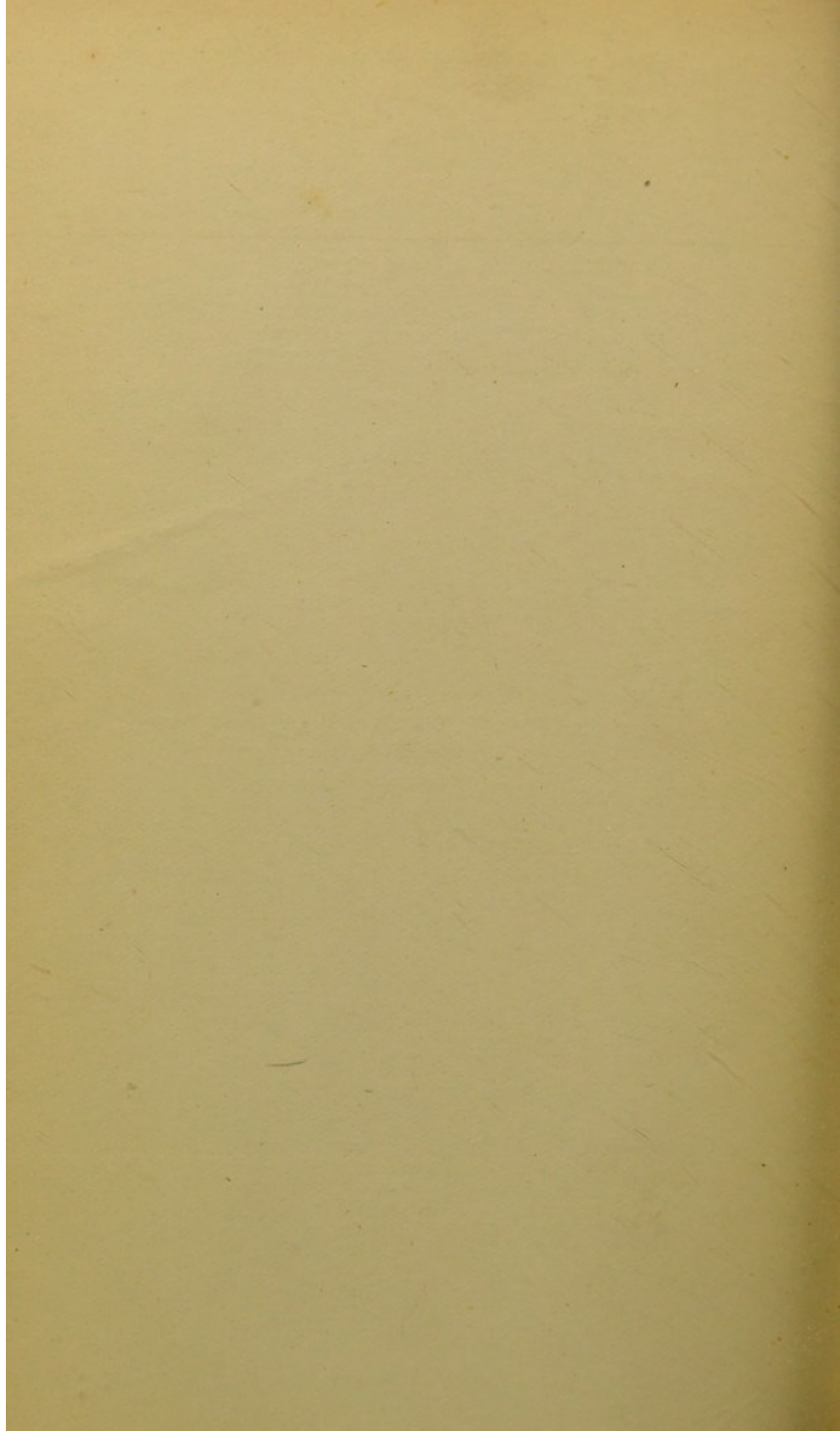
PHYSICIAN TO ST. PANCRAS AND NORTHERN DISPENSARY;

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Author of 'Past and Future,' etc.



LONDON :
ELLIOT STOCK, 62, PATERNOSTER ROW, E.C.
1896.



With the Dutchman

Close to the water

With the Antiquary

Class Lodge, 1882

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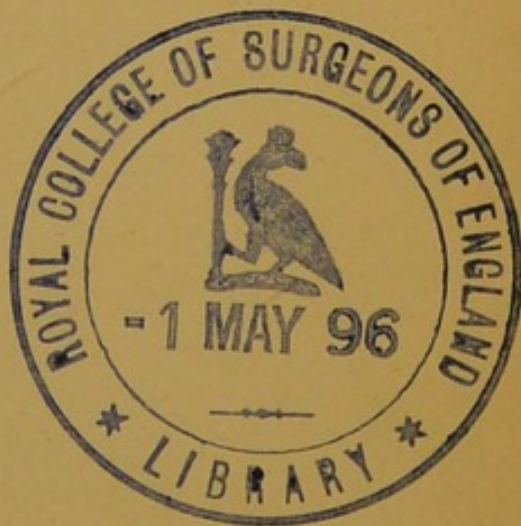
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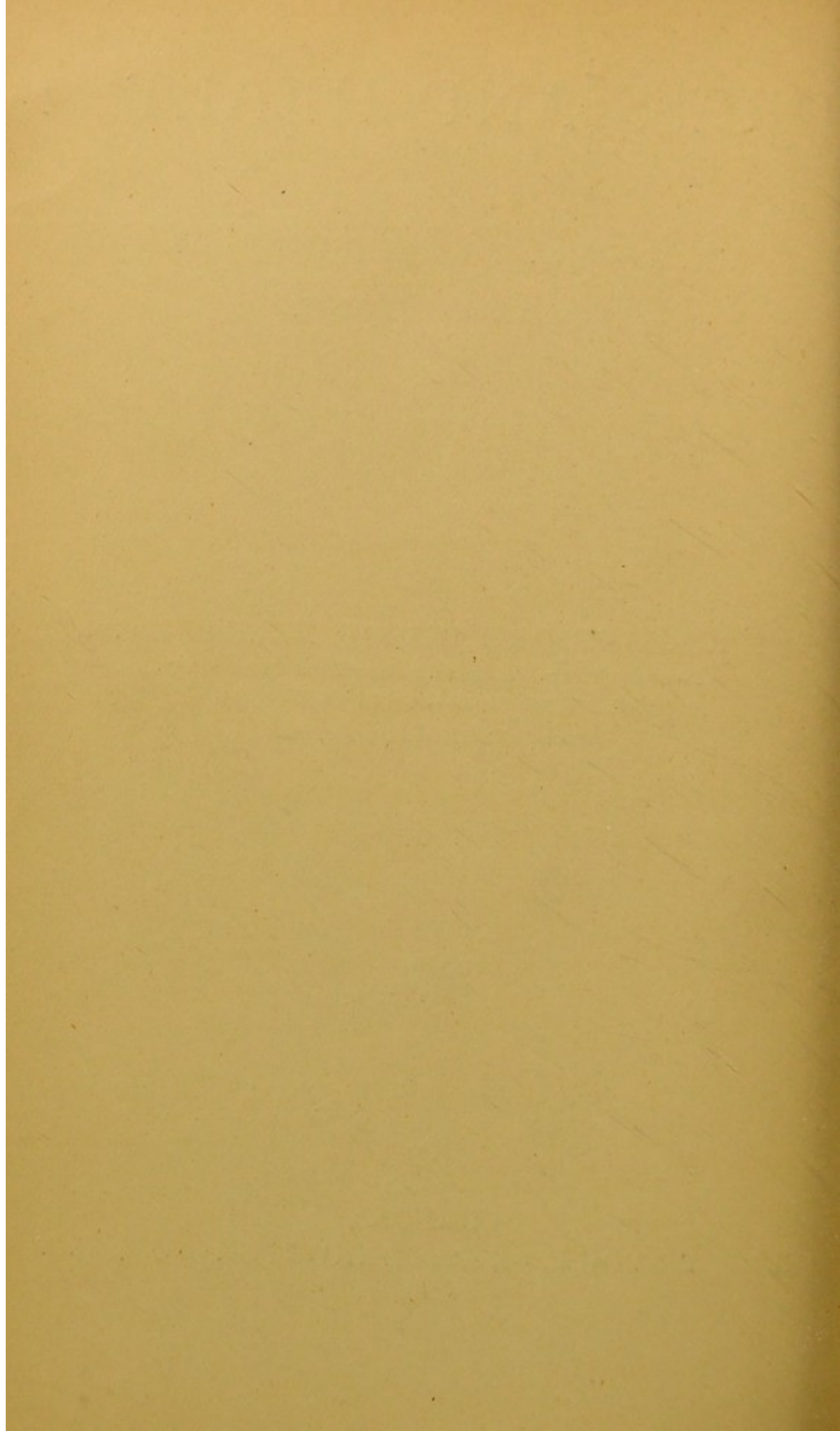
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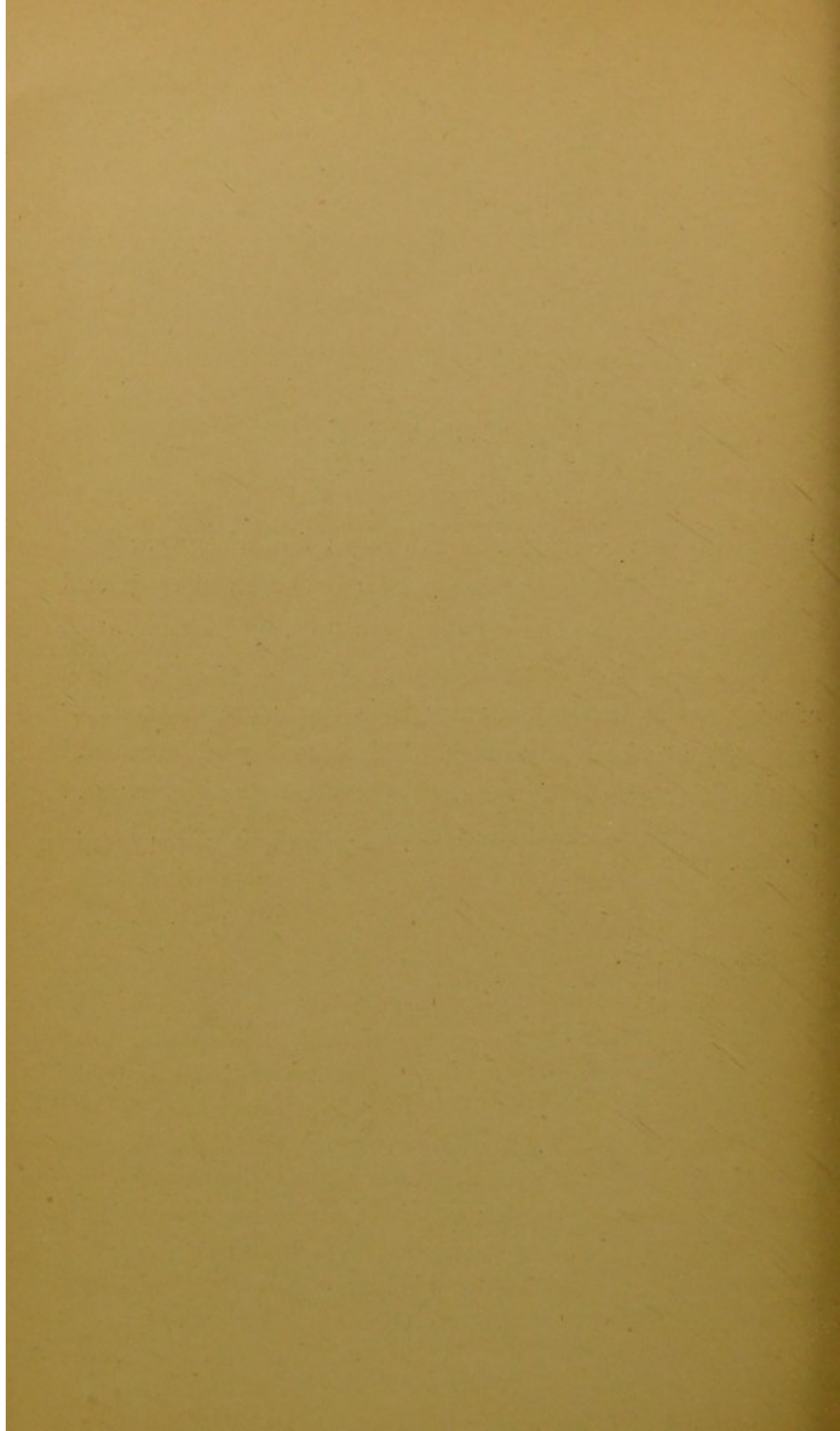


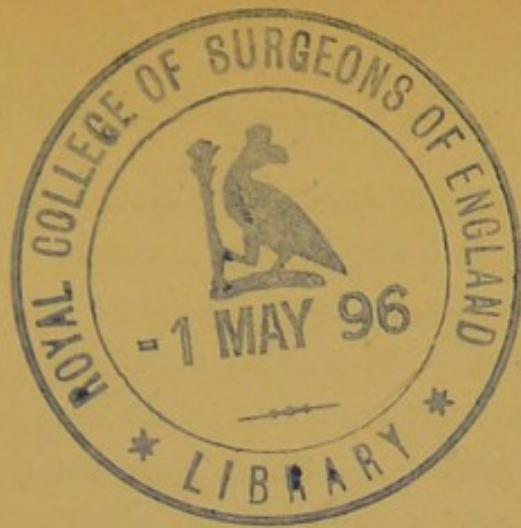
P R E F A C E .

THE two essays contained in the pages following were read before the British Medical Association at Dublin in 1887, and at Leeds in 1889. These papers are now, by permission of the Editor of the Association's Journal, reproduced, with additions and necessary alterations, in the belief that a wider circulation may be of advantage. The first essay will commend itself to those who are interested in Charitable Institutions, and both essays may benefit the Working-classes, to whom health is wealth.

C. M. J.

REDHILL, 1896.





DRESS AND HEALTH.

THE VALUE OF FLUID MEAT FOOD AND WASTE IN THE METHOD OF ITS PREPARATION.

In the preparation of beef-tea it appears to me that there is a considerable waste of material, which arises from a desire to give food of high nutritive value in small quantities, irrespective of its component parts combined in natural proportion. This idea has been fostered by an eminent chemist, whose preparation has not the object, as he himself stated, of feeding the sick, but unfortunately is adopted by the public for that purpose. Nature does one thing, man another ; which is the preferable teacher I will endeavour to show.

Forty years ago patients were deluged with meat-washings under the belief that they were being nourished ; as they did not improve, brandy was added, so between brandy and meat-washings their recovery was delayed, under a mistaken idea that there was virtue in scent, salts, and brandy. Pounds of meat were, and still are, wasted in the preparation of beef-tea, whilst brandy is rightly tabooed. Medical men know perfectly well what good beef-tea should be, but patients complain that the doctors do not give them easy directions for its preparation. There is some truth in the complaint, for we are apt to forget that what we are familiar with, the laity, including nurses, is unlearned in. We accept the off-hand statement, ' We know all about it,' without inquiry.

One reason for waste in material is that the fastidious palates of the sick are catered for, whilst their bodily health is unintentionally neglected: this results from ignorance. Nurses, cooks, and patients all clamour for clear beef-tea. Clear beef-tea is of no use to anyone as food. It is true it is 'just what the patients like,' and what they 'can be got to take'; but what is proper for sustenance is lost sight of. However well beef-tea may be made, the most important part is left at the bottom of the cup—'the grounds, which are no good.' The patient does not progress; the attendants 'have done all that they can do'—which is just what they have not done by rejecting the 'grounds as no good.' When patients are sick their mental equilibrium is more or less at fault and against their will they must be fed. Attendants, therefore, require instruction, and with requisite tact they will apply that knowledge.

Starting then with the proposition, (1) that the essence of meat-tea resides in the fibre of meat and not in the salts contained in the meat, it is clear that only a certain amount of muscle containing fibre and salts in natural proportion can be suspended in a given quantity of water; (2) that the object of meat-tea is not to provide a pure stimulant devoid of nutritive value, but (3) that of giving nutriment to a patient incapable of mastication, able only to swallow fluid food of high nutritive value in small quantities, until the triturating means supplied by nature again becomes available.

I propose, therefore, to bring together (1) facts relating to the nutritive value of meat and what becomes of it after ingestion; (2) to comment on the literature of the subject as found in various journals; and (3) to consider how waste may be remedied and a saving to public and private institutions effected.

PHYSIOLOGICAL VALUE.

Meat consists of 78 parts of water, and 22 parts of solids, nearly all albumin or nitrogenous substances (easily assim-

lated), from which a much more rapid metamorphosis of tissue takes place than from vegetable food. Hence, when meat fibre enters the stomach the gastric juice converts it into a soluble crystalloid, or peptone—that is, into a condition capable of being diffused through animal membrane. By osmosis, or the tendency of fluids of different densities when separated by a membrane to pass through its pores and to mingle, it passes through the walls of the capillaries of the stomach, whence it is conveyed to the liver by the portal vein before entering the general circulation.

The duty of this nitrogenous substance is to develop and renovate the tissues, assist in the formation of secretions and produce force. Every substance in the body in which any form of force is manifested is nitrogenous; and as nitrogen where function is performed is traceable throughout the world such constancy proves necessity. ‘Nitrogenous substances composing the textures of the body determine the absorption of oxygen. The absorption of oxygen does not determine the changes in the tissues, but changes in the tissues determine the absorption of oxygen. In other words, without the participation of nitrogenous bodies no oxidation and no manifestation of force is possible.’* Hence, if nitrogen be cut off from the body the various functions languish and the body dwindles.

Gelatin is the least perfect kind of albuminous matter existing in animal bodies, and its nutritive value is one-quarter that of albumin. ‘It is chiefly destroyed in the blood and the gland-cells, and its energy, therefore, has a direction different from that of albumin.’ Submitted to prolonged ebullition, or 220° Fahr., it evolves ammonia, becomes syrupy, loses the property of coagulation, and speedily putrefies. Hence its nutritive property is destroyed, and it impairs digestion.†

Fat arises from albuminates, so that the nitrogenous

* Parkes.

† Power.

substance plays two parts ; first, it is the regulator of oxidation and of transformation of force ; and, second, it forms a non-nitrogenous substance which is oxidized and transformed. Fat stored up in fattened pigs cannot be derived from the fat given in the food, but must have been produced partly from nitrogenous substances, but chiefly from the carbo-hydrates. So also it seems now probable that the fat in milk is not derived at once from blood, but from changes of albumin in the lacteal gland cells.*

The digestive system of man is framed so differently from that of the carnivora, that fat must be taken in its own form, for it either cannot be formed in sufficient quantity from albuminates, or the body is poisoned by the excess of nitrogen which is necessarily absorbed to supply it ; hence fat must be taken in addition. An excess of albuminates causes a more rapid oxidation of fat (and in dogs an elimination of water), while an excess of fat lessens the absorption of oxygen, and hinders the metamorphosis of both fat and albuminate tissues.†

Chossat laid down as a ' broad principle, derived from experiments on many different living creatures, that life ceases when an animal loses two-fifths of its weight ; so that an animal weighing 100 pounds would die when its weight was reduced to 60 pounds.' ' The daily loss amounts to one twenty-fourth of the entire weight—a statement in harmony with the conclusion of Bidder and Schmidt, that an animal, to maintain its weight, ought to take one twenty-third part of it daily in the shape of food susceptible of being assimilated, water, oxygen, and inorganic salts of course included.'‡

(1) An adult European, 150 pounds in weight, requires daily in *moderate work* 22·866 ounces of water-free food ; that is, 0·15 ounce for each pound of his weight, with which is incorporated from 50 to 60 per cent. of water, making a total of 40 ounces, equal to 305 grains of nitrogen. In addition, he requires a total water-supply of from 70 to 90 ounces, being

* Parkes.

† *Ibid.*

‡ Guy's ' Forensic Medicine.'

an average of 0·5 ounce per pound weight. (2) In *rest* the amount required daily is about 16 ounces of water-free food, equal to 240 grains of nitrogen ; and this quantity is sufficient. (3) The *smallest* amount of nitrogen necessary for the inner movements of the body and bare maintenance of life is 138 grains, or 2 ounces.* This may be considered to be the sick man's state.

The quantity of urea passed in twenty-four hours is said to be the measure of the ingestion of nitrogen ; but this view seems somewhat defective because in fasting, or with non-nitrogenous diet, urea is still secreted. Nitrogenous diet, therefore, cannot be its sole source. Hence the determination of the quantity of nitrogen to sustain life, or to keep up movements within the body of an adult, does not depend upon the amount passed as urea, since urea does not depend upon nitrogenous food for its sole production. The human body may be likened to a closed vessel full of liquid with escape-valves ; extra liquid added will escape by the valves and be a measure of the liquid added, but the drops which escape are not the drops that were added, for the overflow depends on the inability of the vessel to hold more than it can contain. Extra nitrogenous diet, therefore, when used, determines the passage out of the body of matters which have performed their functions, at a rate proportionate to the activity induced by fresh material, and is a measure of the mechanical energy throughout the body, but is not an index of what is required to sustain life.

A cubic millimètre of blood contains about 5,000,000 of blood-corpuscles, each one of which Dr. Hunter considers to have a life-duration of probably three weeks. Many millions of corpuscles are doomed at every round of the circulation to destruction and conversion into urea and the like. This destruction, says Dr. Paton, must be considered a powerful stimulant to the secretion of bile, the liver having as one of its

* Power.

functions the elimination of effete hæmoglobulin. By this same process urea also is increased. Hence urea (which is formed even in starvation) continues to be secreted till there are no corpuscles left to secure the office of respiration and to go the round of the circulation. But when fresh albumin enters the portal circulation, the blood-pressure is raised and products, ready formed for use in the direction assigned them, are passed on.

For the state of rest in health, 240 grains of nitrogen daily are said to be sufficient. But a bed-stricken patient, whose muscular and mental efforts are reduced to a minimum, whose vital processes are carried on with much less energy than usual, and who loses comparatively little heat, requires a relatively small supply of food; as, however, at least 138 grains of nitrogen must be supplied, this supply should be thoroughly wholesome, easily digested, and consist of nutritious material.* Animal food especially rich in nitrogenous elements digests in proportion to the minuteness of its division and tenderness of its fibre sooner than farinaceous food; it is, therefore, better adapted for those who are only able to take small quantities at one time.

Fluid meat thus introduced into the stomach becomes peptonized by the gastric juice, is absorbed by the vessels of the stomach, and is transferred to the liver; arrived at the interlobular veins, it traverses the acini by fine capillaries, which enter the intralobular veins for conveyance to the right auricle. This work goes on constantly, like the daily routine work in a manufactory, where, when new material is brought in, there is increased energy in all departments. The process also is comparable with iron-ore entered at the mouth of a smelting-furnace, which, after being passed through several ovens, appears finally at the orifice of exit converted into steel. No one sees the conversion, but the highly-finished product is far different from the raw material.

* Power.

LITERATURE OF THE SUBJECT.

Meat extract, says Dr. Beneké,* is made by chopping 1 pound of beef finely, and mixing it with its weight of cold water slowly heated to boiling, then briskly boiled for a minute or two and strained. Six pounds of meat thus treated yield, after evaporation in a water-bath, 3 ounces. Hence 1 ounce of this extract equals 32 ounces of meat.

Dr. Hassall† exposes the fallacy of this supposed nutritive value, since fibrin, gelatin, albumin, and fat are absent, and that what remains consists of excrementitious substances and blood-salts.

Baron Liebig himself says that neither tea nor extract of meat is nutriment in the ordinary sense. 'It will be well understood, therefore, that by the addition of extract of meat to our food we neither economize carbon for the maintenance of the temperature, nor nitrogen for the sustenance of the organs of the body, and that, therefore, it cannot be called food in the ordinary sense.'‡ 'Dogs fed exclusively on extractum carnis die sooner than those not fed at all, which seems to be due to the deleterious influence of the potash salts contained in the extract; for though these are indispensable in the economy, yet a larger dose of them is injurious in the absence of food whose metabolism [alteration] it is their office to direct.'§

A patient may be swallowing several ounces of extract daily, and yet be actually starving; he may feel better for it, but his strength will not return unless he can swallow something else as well.

'We have eaten half a pot of the stuff and remained as hungry as ever, the only effect being to produce thirst, to heighten the bodily temperature, and to increase the nitrogenous waste in the urine.'||

* *Lancet*, 1851.

† *Ibid.*, 1865.

‡ *Ibid.*, 1869.

§ *Medical Times and Gazette*.

|| Editor of *Medical Times and Gazette*, 1871.

Prepared extracts of flesh, fish, and crab have been used for several centuries, and probably longer in different countries, says a writer in the *Medical Times and Gazette* for October, 1870. In the Malay Archipelago certain meats—sea-fish and little marine crabs the size of a pea—are reduced to extracts, and used extensively as flavours; these extracts are used also to strengthen celebrated native dishes.

These extracts, then, are good stimulants, and useful to bring up the flavour of poor soup, but have no nutritive value, and they require very great, if not greater, caution in administration to the sick than wine or brandy.

Meat extracts are neither direct aliments, for they contain no albuminous matter; nor indirect aliments, for their azotized principles do not arrest disassimilation.* In small doses they may be useful from the stimulant action of the potash salts, which aid digestion and circulation. In larger doses they have an injurious effect. In prolonged illnesses, when the powers of life are enfeebled, the salts of potash may, in place of favouring nutrition, impede it (1) by direct action upon the blood-globules causing a diminished absorption of oxygen; (2) by the predominance of salts in the serum which exert no special solvent action on carbonic acid, do not permit the exhalation of the normal quantity of this gas, and consequently lessen the introduction of oxygen. To give these extracts alone is to keep the patient in a state of inanition.†

In the *Lancet* for 1869 I recommended that a piece of meat (beef, chicken, or mutton), free from fat, about the size of the top of the thumb as far as the nail, should be ground to a fine pulp between two stones or in a mortar; this pulp put into a teacup with two tablespoonfuls of cold water and warmed by a fire—ten minutes is sufficient; a pinch of salt added, and then poured into a cold cup. The whole (grounds and fluid) is to be swallowed, and repeated every four hours. Given in this way, it will be regarded as a medicine and taken, when as

* M. Müller in *Medical Times and Gazette*, 1872.

† *Ibid.*

beef-tea it would be rejected. This process is intended for cases of emergency where delay would be injurious. Meat scraped for the required quantity is a good plan ; or cooked meat pounded up and mixed with warm water will serve equally well, for it is the fibre which is to be relied on.

Dr. Leared describes a digester, into which he puts 1 pound of beef, finely minced, with 4 ounces, preferably 8 ounces, of water ; from this he obtains 9 or 13 ounces of beef-tea.* But he does not say how he disposes of the remainder.

In the *Gazette Médicale* 2 pounds of beef are directed to be taken, chopped up, and placed in a litre of water, with a small quantity of hydrochloric acid ; this is to be boiled for fifteen hours, then strained, the mass crushed, emulsified and boiled again for fifteen hours. The whole is then neutralized with bicarbonate of soda, and evaporated to the consistency of pap.†

Dr. Leared gives another method, in which he macerated 1 pound of crushed muscle for three-quarters of an hour with a pint of cold water ; this was boiled for two hours and then strained.

In the *British Medical Journal* for 1880 is described a complicated process, the last of the various methods described in the journals. Except the French method, which is peptonized beef-tea, only one aims at presenting to the stomach meat-fibre in its natural condition, small in bulk, and of physiological value when swallowed ; the rest are highly-scented and highly-salted specimens of broth of little nutrient value, and extravagant waste in production.

WASTE OF MEAT.

Private individuals and public institutions have various ways of making beef-tea—some boil for long periods and others add ‘stock’ ; and equally varied are the ways of disposing of the remainder, when they have, as they term it, ‘extracted all the

* *Lancet*, 1874.

† *Ibid.*, 1873.

goodness out of the meat'—which means they have wasted half or two-thirds of the quantity of meat employed, and double salted what they have retained; the effect of which concoction is to produce thirst, heighten the bodily temperature, and increase nitrogenous waste. These results arise from the salts being out of proportion to the albuminates. The half or two-thirds of discarded fibre, termed 'refuse,' is by some sold with 'hogs' wash'; by others thrown into the ash-pit—in one institution alone I know that over twenty pounds were thus daily thrown away; others, again, charitably (!) give it away. If the goodness has been extracted, where is the charity? Surely actions belie words. Each class thus satisfies its conscience that subscribers' or ratepayers' money is not wasted. Private individuals generally throw the remainder into the ash-pit; there are others, however, in both classes who, more thrifty, use this remainder in soup or other ways.

Within a radius of five miles or thereabouts around St. Paul's Cathedral, there are 70 charitable institutions with beds for the sick, and 23 Poor Law infirmaries. In these 93 institutions there are no less than 22,906 beds, used by over 129,000 persons in the course of the year. On the supposition that one-quarter, or 5,726, of these beds are continuously occupied by those who will throughout the year require fluid meat food daily, and allowing 12 ounces of meat for each pint* of fluid food, there will be required 4,294 pounds—*i.e.*, 1·91 tons of beef per diem. For the year the amount will be 690·2 tons. I venture to think that this amount is *two-thirds* in excess of what is necessary to be used.

Now, the cost of 4,294 pounds of good, or rump, beef, on the supposition it can be contracted for at *sixpence a pound*, will

* The British soldier is allowed one pound of meat for a pint of beef-tea. The broth and meat used to be served together, so that the patient knew he had his ration: the method was neither appetizing nor convenient. When the beef-tea was made as recommended below, the attendant on duty always had fluid food throughout the twenty-four hours; he could thus regulate the sick man's rations according to his wants.

be £107 3s. 6d. per diem, or £39,118 17s. 6d. per annum. But the cost of *one-third* of this quantity of beef for one day will be £36 12s., and for one year £13,039 12s. 6d.—that is, a saving of £26,079 5s. per annum will be effected; or, on the calculation of shin-beef at 4s. 6d. a stone, there would be a saving of £19,808 5s. This ought to be worth consideration by the authorities in charge of ninety-three charitable institutions. For large establishments, where 100 or more pints are used daily, this is a subject for inquiry, since not only is there waste of food, yearly loss of revenue, no benefit to the sick, but habits of extravagance fostered amongst a class of persons who, of all people, should practise and be taught economy.

Of course, the present system is continued on the plea of succouring the sick person with 'the best beef-tea that can be made,' whilst his starving brother lies outside vainly wishing for what the pigs are fed upon. But admitting that the present method is continued—as I believe it is—from honest conviction that it is the best, *may it not be worth while to inquire if it cannot be improved by putting on one side preconceived notions and the dull round of routine*, by adopting a method which does not countenance waste, does not injure or defraud the sick, and does reduce the butcher's bill?

Since albuminates are essential to health, and animal food digests in proportion to the minuteness of its division, how much meat-fibre can be suspended in a given quantity of water to make such a draught of nutriment agreeable in swallowing? After many trials, I find—that 4 ounces of meat can be suspended in one pint (20 ounces) of water; this can be taken without disgust, that is, 'grounds' do not collect on the palate nor remain in the gullet to annoy the patient—and, that from 2 to 4 ounces of such fluid given every three or four hours is sufficient for any sick man. If, therefore, a patient receives a pint and half of such food in twenty-four hours, he gets a large supply of nitrogenous food, enough even for a

healthy man in a state of rest. If the meat-food is made stronger than in this proportion the sick man will refuse it, and this is a trouble which will be overcome by a good nurse.

One ounce of the best meat contains 14.22 grains of nitrogen, 6 ounces will contain 85.32 grains; and as 138 grains of nitrogen are supposed to be required, the remainder has to be made up from eggs, flour, and other matters. But the question has frequently arisen in my mind whether a sick man does really require so much nitrogen daily. Theoretically he may, but practically he does not, nor does he get it. On many occasions I have witnessed very remarkable results from much smaller quantities of meat-food—very far below the physiological quantity—so that I cannot help thinking there is some fallacy in the quantity of nitrogen required to keep up the inner movements of the body, particularly if urea, as hitherto maintained, is not the measure of nitrogen required, but in part the measure of the disintegration of the blood-corpuscles.

In making fluid meat-food, *there should be neither refuse nor remainder.* Say 100 pints are required; 25 pounds of good rump beef free from fat and gristle, well chopped up or minced, are placed in a digester with 100 pints of water and boiled for three or four hours, being frequently stirred and rubbed about with a wooden masher. At the end of this time the fibre is cooked; it should then be passed through a colander, to ensure all the fibres being thoroughly broken up. If the process is properly managed there will be no remainder. Or the meat, after it has been passed through a mincing-machine, may be put into a cylindrical wire cage of nine or ten meshes to the inch, and placed in a digester. This plan would enable the cook to assist from time to time the disintegration of the fibre by shaking the cylinder. No straining would be required, for at the end of three or four hours the cylinder would be empty and the meat food ready for use. If required, this can be seasoned with salt, onions, and so forth.

The better the quality of meat, the less gelatin there will be, and the flavour of the fluid food will be improved, for prolonged ebullition has not destroyed whatever nutritious properties the gelatin may possess.

Meat-tea food made from rump meat is far superior in flavour to that made from shin-beef. I satisfied some sceptics on this point by submitting samples of each kind of food. Each one without knowing one sample from the other selected that from rump-beef as 'proper beef-tea.' The food of nature is in this way simply cooked, and suspended in a given quantity of water. The salts are in proportion to the albumin ; the draught is thoroughly wholesome and, if administered not more frequently than every three or four hours, the stomach will have suitable intervals of rest. The addition of stuff called 'stock' is not required, for, besides being injurious owing to prolonged ebullition, it imparts a disagreeable flavour.

The secretary of a large London hospital, six or seven years ago, informed me that the patients would only take beef-tea made with stock, for then it had a flavour and tasted strong. It is evident that such patients had no right to be recipients of public charity. The object of hospital charity is to benefit patients' bodies and make them fit again for service and not to tickle their palates.

If alimentation by enema or stomach-pump has to be employed, only half or one-third of the quantity of water need be used, or even less, so long as the food is sufficiently fluid to pass through the feeding-tube.

For workhouse infirm-wards, the cut-up 'shin of beef' can be placed upon a strainer of nine meshes to the inch within an ordinary meat-boiler and by frequent stirring the disintegrated fibres will drop through. In one institution which has adopted my suggestion this process answers admirably and gives the cook no trouble.

In the year 1888 Dr. Laffan obtained from Sir Charles Cameron an analysis of the old and new processes as follows :

				New Process.		Old Process.
Water	...	...	...	94'65	...	98'45
Albuminates, crystalline bodies,						
kreatin, etc.	...	...	...	4'25	...	0'90
Fats	...	...	...	0'20	...	0'07
Salts	...	...	...	0'90	...	0'55

The fluid from the new process was thick, and the old clear.

For travellers and urgent use at any time, water-free beef, pounded and sealed hermetically in small tins, would be very advantageous; but all fluid extracts are disappointing and expensive. Poor folks require food within their means, and for such the above method is advantageous, let alone the saving such a method will be to public institutions.

P.S.—In reviewing the literature of this subject I passed by the recommendation of the use of raw meat. I do not know that it has any advantage over cooked meat, and, as far as my memory serves me, the late Dr. E. A. Parkes held the same opinion. It must be repulsive to those who are not accustomed to such a mode of feeding and, further, the mental effort to overcome this repulsion must more than counterbalance the advantage to be derived. An amusing incident once came to my notice of a baby fifteen months old—a peevish, troublesome child, improperly fed and under no control. It had a slight cold for which a lady visitor prescribed raw meat and sugar. A pound and a half of beefsteak was chopped up very finely, pounded and mixed with brown sugar, which ‘baby helped to mix’; but baby, when offered the delicacy, pursed his lips and with yells declined the dose.

ANCIENT DRESS COMPARED WITH MODERN.

AMONG civilized communities, dress is a subject that has claimed considerable attention and is a fruitful topic of conversation among women of all classes; nor are men behind-hand in considering the fashion of their coats, hats, beards and whiskers. Of late, however, female dress has attracted increased attention from the endeavour to return to a more healthy arrangement—that is, to make fashion conform to Nature, in place of the internal organs being moulded and controlled by fashion; this return can only take place by considering the form, varied movements and functions of the organs contained within the body. Therefore in the following pages I shall bring briefly under notice; (1) various forms of attire known to us from the earliest periods; (2) a review of the injuries caused by unsuitable clothing of the trunk; and (3) suggestions for improvement, with observations on various fashions.

SECTION I.

The earliest record of clothing dates from 5,900 years past, in the sentence, 'They sewed fig-leaves together, and made themselves aprons.' In this sentence Moses describes a form of dress common amongst the people of Egypt, the land where he dwelt; he subsequently adds, 'Adam and his wife were clothed with coats of skins.' From this epoch, as men multiplied, different divisions of labour would occupy different sections of the community: some would make one article, some another, and each would barter his speciality. Garments at first would be made by sewing broad leaves together; slender grasses and rushes would be twisted into fine strands and converted into a loose, open fabric. Afterwards hair, cotton fibre, silky fibre, silk, or even birds' down—a shawl of which, termed 'tozer,' from Cashmere, is now in my possession—

would be used. The manufacture of all kinds of clothing would give employment to various sections of this community, material obtained from vegetable matter being chiefly used; whilst skins, being difficult to obtain by an ever-increasing population, would be valuable for sandals, shoes, leggings, ropes, shields, drinking-cups, the carriage and storage of water (used for this purpose to this day in India, Egypt, the desert, and other places at a distance from water), and as caldrons for cooking even up to the ascension of Edward III. to the throne.

It is also certain that before the reputed date of the Flood the inhabitants of the earth must have been well acquainted with the manufacture of cloth, for soon after Noah left the ark he is found in his tent without a garment. Rebekah, when she met Isaac, covered herself with a veil; Joseph also had a coat of many colours. More than 3,625 years ago, therefore, there were not only different textures of cloth, but a variety of dye-processes. Moreover, anterior to this period, in the very dawn of Egyptian history, over 6,000 years ago, we find, from paintings in their early tombs, that the Egyptians excelled in industrial arts—agriculture, boat-building, spinning, weaving, brick-making, sculpture, portraiture and the like. All this industry presupposes an antecedent civilization of which we have no record, but of which Mr. Donnelley's interesting and possible theory of the disappearance of a populous, mid-Atlantic island may be an explanation. He has described it in '*Atlantis, the Antediluvian World*,' published by Sampson, Low, Marston and Co. In confirmation of such a theory, we have in recent years heard of the total disappearance of the large and lofty island of Kra-Katoa, near the Straits of Sunda. No strain, therefore, is put on the imagination for the reception of the theory which Mr. Donnelley lucidly explains.

In the colossal statuary of Egypt the figures are nearly nude, having only a piece of stuff round the waist with short aprons half-way down the thigh made of papyrus-plant material; others, again, have an ampler dress made probably of flax, for

Egypt was famous for different textures of linen, since Joseph was arrayed by Pharaoh in fine linen. There is no statuary of the Israelites and no special record of their dress, so that in all probability it was similar to that of the Egyptians.

Among the inhabitants of Asia Minor—Medes, Syrians, Assyrians, Persians, Parthians, Phrygians, Lycians and Amazons—the men wore a vest with tight sleeves to the wrist, long pantaloons of skins, or of rich and fine tissues, embroidered or painted in sprigs, spots, stripes, cheques, zigzags, or lozenges—tight or loose, falling in wrinkles over the shoes, stuffed into the shoes, or tied round the ankles. The vest like our waistcoat opened in front and was closed by clasps; over this the mantle—a conical cap and laced boots completed the costume. In war the Amazons were similarly attired, but in peace wore long skirts. At the present day, Indians use tight-sleeved vests of a gauzy material and tight-fitting pantaloons falling over, or stuffed into, their shoes. India was as famous for its cotton fabrics in the time of Herodotus (B.C. 445) as Egypt was for its linen.

In Greece linen was used earlier than in Rome. The Greeks used a light creasy stuff next to the skin, when worn fitting the body, and over this a tunic, sleeveless or with long and wide sleeves, fastened by a clasp on the shoulder and a girdle round the waist; when the tunic was long this was gathered up a second time under a ligature lower down, and then would reach to the middle of the thigh. The tunic was made of two square pieces of cloth sewn together without sleeves. In earlier times it was made of wool, in later of flax, then flax mixed with silk. It was worn by both sexes next the skin, but considered by male philosophers a luxury. By women it was worn loose, or confined by a girdle, and reached to the feet. The women wore their hair down the back or tied it into a bundle, leaving a loose lock or two, as did the Egyptians and some British spinsters at this day. They also adorned their heads with fillets or wreaths of flowers. In

mourning the hair was cut close to the head and the tunic, dyed black, descended to the feet. The *peplum*, or mantle, was the outermost garment used by both sexes ; it was mostly worn by elders, and on all occasions of ceremony ; a flat, broad-brimmed hat was worn with strings tied under the chin ; when thrown back it rested upon the shoulders. The god Mercury and Heroes on a journey are thus represented on Etruscan vases in the British Museum. The Greeks wore sandals and occasionally went bare-foot ; but Eastern personages used slippers, sandals rarely.

The ancient Romans had no other clothing but the toga, used by both men and women ; it distinguished them from the Etrurians. It was a loose, flowing woollen robe of yellowish colour, covering the whole body to the feet, straight or semi-circular in form ; it covered the left and half of the right arm. They had neither stockings nor breeches ; sometimes they wrapped pieces of cloth round their legs and thighs. The tunic was introduced at a late period, and considered a luxury. In later times the Roman soldiers wore tight drawers to the middle of the calf, probably from imitation of the Celts, whom at first they derided as 'breeched barbarians.' Linen from Egypt was introduced under the Emperors ; the first Emperor who wore a robe of pure silk was Heliogabalus, in the year 218.

The Roman, and also British, ladies wore a long gown to the feet and a shorter tunic, 'sherte' or 'camise,' to the knees. Gauze fabrics which displayed rather than concealed the figure, and silken clothing displaced the old woollen dresses. The Roman ladies used a broad breast-band for supporting the bosom, called *strophium*, which may have given rise to the modern corset. The article of dress called stays was brought by the Normans into England in the twelfth century. 'Romances of the Middle Ages teem with allusions to and laudations of the wasp-like waists of the dames and demoiselles of the period.' 'A custom fertile in disease and death.'

Stephen Gasson, Rector of St. Botolph, 1600, published in

'Pleasant Quippes for Upstart Newfangled Gentlewomen,' dated 1595, the following attack on the bodice of the time of Queen Elizabeth :

'These privie coats by art made strong,
With bones, with paste, and such like ware,
Whereby their backs and sides grow long ;
And now they harness gallants are.
Were they for use against the foe
Our Dames for Amazons might go ;
But seeing they do only stay
The course that Nature doth intend,
And Mothers often by them slay
Their daughters young and work their end,
What else are they but armour stout
Wherein like gyants Jove they flout ?'

'The stays that retained their character as a "pair of bodies" are seen in an old print about the year 1700, which represents the front and back of a young woman whose stays are composed of two pieces laced together before and behind. And a pair of stays they continued to be called notwithstanding their subsequent incorporation. The monstrous "whalebone prisons" of the time of George II. are delineated in some of Hogarth's instructive engravings.' (See J. R. Planché's 'Costume,' etc.)

M. Maspéro says of the Egyptian nobles (see 'Life in Ancient Egypt and Assyria,' p. 272), 'They wear little, and their garments are of simple white linen, but the quality is so light and fine that the form and colour of the body are visible through it, and contact with it is a caress to the limbs. On the contrary, the Assyrians seek for heavy, stiff materials, shaggy and loaded with fringes, overweighted with many coloured designs and embroideries. Their garments envelop them completely from neck to ankle, but they drape badly, and encircle the bust and hips almost without folds. Even the women seem to prefer a style of dress which enlarges them and conceals their natural shape as much as possible ; the wadded cases in which they imprison themselves give them a stiff,

awkward appearance, which contrasts most unfavourably with the supple grace and easy movements of the Egyptians.'

The Celtic races used *bracæ* of striped or chequered cloth of wool, dyed of various colours, the predominant colour being red; they were worn loose or tied at the knee; or they were full and gathered at the ankle; these were the trousers or trossers, the prototypes of the Highland *truis* of the present day. The cloth was called *breach*, from the Celtic *breac*, which signifies speckled. The French and Saxons in the ninth century used drawers, and 'to go without them in the Middle Ages was counted a penance and a shame to do so.' Sixty years ago this garment was not in general use among men and women. In 1374 the Jacket, called the 'Jack,' was in vogue; it was worn over the doublet. The doublet was a dress which at first had no sleeves. Sleeves were afterwards added, and, being separate, were used according to the fancy of both sexes. 'Gown' was a word first used in the fourteenth century and applied to garments of various materials used by both men and women. The gowns in the time of Richard II. and Henry IV. were worn high in the neck by both sexes, but by women with long trains. Up to 1573 men wore gowns, but after this date they were limited to legal and official persons, merchants, physicians and citizens of age and gravity. At the end of the seventeenth century this term had disappeared except for morning and night, or bed, gowns. In the time of Henry VIII. waistcoats were worn by men under the doublet and by women with sleeves. This vestment with sleeves is retained amongst grooms. In the time of Chaucer both men and women wore hose. Gloves either with or without fingers were used by both Greeks and Romans, but in England not until the eleventh century, their place having been supplied by the long sleeves of the gowns. The Indians and Chinese to this day thus utilize their long sleeves.

From this brief account of the principal articles of clothing it may be assumed that, as civilization advanced, a desire for

varied and costly attire progressed *pari passu* with the increase of mankind. The prophet Isaiah, B.C. 760, was scandalized with the luxurious dressing of the Jewish women, and denounced them in his third chapter. Nor are the writers of Greece, 350 years later, more lenient in speaking of women, for Euripides savagely remarks, 'Woman is an animal fond of ornament.' Amongst the Romans excess in dress was restrained by sumptuary laws. Even in England numerous statutes as late as 1574 of Queen Elizabeth's reign censured extravagance in dress. The indecency of dress at the beginning of this century is well described in Wright's 'Caricatures' of the reign of George III. And if senators have not troubled themselves since that date, it is because they have been content to leave the matter in the hands of historians, satirists and humorists.

The object of all clothing is for self-preservation. Ornament has another object shared in by the denizens of the forest as well as mankind. In four-footed animals the vital organs and most sensitive portions of the skin are placed inferiorly, but anteriorly in the case of man. When a quadruped advances he opposes the sturdiest part of his framework—head, chest and shoulders—to any obstacle in front, clearing a passage for more delicate and less-protected hindermost parts of the body following. But man has not the same advantage; in advance he exposes the whole front of his body in passing through thickets or jungle-grass, so that the least protected portions of his body are liable to injury, and also annoyance from insects; hence loin-cloths and aprons became a physical necessity for protection. In sleep the same protective instinct is prominent. Satiety produces a desire to sleep, and animals, after feeding, generally assume the ancestral or prebirth posture; they curl themselves up to protect vital organs from injury and for warmth, for in sleep the temperature of the body falls. Man is no exception to this general law of Nature—in sleep his head and back are curved and his legs drawn up.

The early inhabitants of the earth were content with garments of leaves and bark till they were able to obtain the skins of birds and beasts. At this day the Chinese and Japanese convert bamboo leaves sewn together into warm cloaks as protection from rain and cold. In the tropics and other places where external heat during the day is very great, clothing for warmth is not required, but when the sun sinks below the horizon every native takes to his burnoose. On the other hand, abnegation of dress may from circumstances be either enforced or voluntary. Enforced in the case of those who have not the means, however brought about, of clothing themselves, as seen in the back-streets of any large town, or voluntarily by those who parade inhabited districts with scanty clothing to excite commiseration.

A human being well clothed, well housed, and well fed, is more sensitive to atmospheric and other changes than one in an opposite condition, whose senses are blunted either by privation or want of cultivation. The brain, known as the central nervous system, and the skin, are in embryological relationship, *i.e.*, they are developed from the same part of the embryo. When both systems are fully developed in the human animal, capable of shifting for itself, the more highly-developed portion takes cognizance of the peripheral or outer layer—the skin—according to surrounding circumstances. If the skin be habitually unclothed, sensation both internal and external is obtuse. Nakedness is no shame: the being exists purely as an animal. But if clothed, the skin becomes sensitive to atmospheric vicissitudes, central sensitiveness is exalted, and this begets a higher degree of intellectual capacity.

In the 'Voyage of the *Beagle*,' Mr. Darwin thus alludes to the condition of the natives of Patagonia: 'Six Fuegians pulled alongside in a canoe; they were quite naked, and even one full-grown woman was absolutely so. It was raining heavily, and the fresh water, together with the spray, trickled down her body. In another harbour, not far distant, a woman

who was suckling a recently-born child came one day alongside the vessel and remained there out of curiosity whilst the sleet fell and thawed on her naked bosom and on the skin of her naked baby.' 'At night five or six human beings, naked and scarcely protected from the wind and rain of this tempestuous climate, sleep on the wet ground coiled up like animals.'

SECTION II.

In the trunk Nature has grouped various organs. In precedence of importance from the head they are the lungs and heart, separated by the diaphragm from the liver, stomach, spleen, pancreas, kidneys, alimentary canal, and the pelvic viscera, *i.e.*, the viscera occupying the bony cavity forming the lower part of the trunk. The lungs and heart are situated within the chest; this is an arched, elastic and moving bony framework, light, powerful and capable of resisting considerable pressure. There are twelve ribs on either side, curved more or less, increasing in length from the first to the seventh and then decreasing. Ten of the ribs enter into the formation of the chest; one end of each rib is connected by a movable joint with the backbone and the other end by a small joint to the breast-bone. The remaining two ribs on each side are termed floating ribs. The breast-bone is suspended by muscles and to some extent fixed by the collar-bones; it is kept in its position by the ribs from either side. There are therefore two points—one fixed (the back-bone) and one comparatively fixed (the breast-bone)—upon which the ribs can move up and down in respiration. Roughly, it may be said that one half of the ribs moves upwards and outwards, and the other half downwards and outwards. To illustrate the action, place the little finger of one hand upon the thumb of the opposite hand; then alternately open and close the fingers. If, therefore, the lower half of the ribs from disease or any mechanical cause does not expand, increased work is thrown upon the upper half; and not only this, but a smaller amount of oxygen than is necessary

for the needs of the system is inhaled each time the breath is drawn; when a patient is ill this lessened amount of air retards recovery.

The diaphragm, or midriff, is an oval muscle constantly ascending and descending in the act of breathing; as it descends it carries down with it the lungs and heart; on rising restores them. No one is conscious that in its descent air rushes into the lungs while the ribs expand, nor that in its ascent the ribs close gently, expelling air from the lungs. The heart, a hollow muscle incessantly in action, moves spirally from right to left; it is also carried down, making a descent of one inch and a half eighteen times in a minute; in deep inspiration this continued movement is equal to a distance of 90 yards per hour, or of 2,160 yards per diem; for tranquil movement about one-third of this distance, or 720 yards. The lungs and heart, then, by the act of breathing on descent of the diaphragm, are gently compressed and displaced downwards; at the same time the liver and stomach also descend from two and a half to three inches. This movement increases the suction power of the right chamber of the heart to draw the blood from the system into it; the venous system is unloaded and the circulation through the liver is accelerated. Thus, digestion is assisted by the uninterrupted performance of the offices of separate organs dependent one upon the other, and the circulation of the blood is sustained. But should this movement be interfered with the suction power of the heart is lessened, and the blood-pressure in the abdominal viscera is raised, for the escape of blood by the veins is diminished. Naturally, inspiration favours this escape whilst expiration retards it.

Women, as men, must have room for food which is to preserve their bodies, and this food must be acted upon by the juices or secretions of organs which expand and contract in the process of digestion. Hence, interference with the elaboration or escape of these secretions cannot conduce to the welfare of

the body, because in the respiration of our domestic pets we see that the rise and fall of the body is unrestricted. Ignorance, therefore, of the positions and actions of the organs of respiration, circulation, and digestion, along with inherited custom, perpetuates on the one hand an article of dress faulty in construction, only fit for the suspension of other garments; and, on the other, leaves unclothed the highest points of the lungs which rise above the collar-bones. Disorders, therefore, which might be avoided are induced, and thus the difference in ratio of lung diseases common to both sexes is probably explained.

The apparatus called stays, designed to improve the figure and for support, reduces the girth of the trunk by lateral pressure and elongates the vertical diameter. This result is attained by concentrating the pectoral and ventral viscera. The spaces between the ribs are narrowed, the tidal capacity of the lungs is lessened, the heart cannot descend and the space provided by Nature for the several organs to work in and move smoothly upon each other is curtailed. The viscera cannot accommodate themselves for muscular action, but are forced into abnormal positions which bring about injuries in both sexes. 'Whether this article of dress shall or shall not inflict mischief on the lungs will probably altogether depend on the amount of constriction;' and although the phthisical mortality of females is somewhere about 300 per million living greater than in males, yet this does not prove the dependence of lung disease upon stays. Drawing in the lower ribs by apparatus more or less unyielding lessens the vital capacity of the lungs, for until the stays are removed the respiratory murmur is scarcely audible in the lower parts. Again, in sleep, on the removal of stays pectoral and ventral action are assimilated to that in males. Increased action of the upper part of the chest in adult women may to some extent be inherited, though it is mainly due to stays which prevent the expansion of the lower ribs. This increased work creates increased flow of blood and exaltation of nervous sensibility to atmospheric changes in this part;

hence the impure air of crowded and heated rooms with insufficient clothing of the upper part of the chest present conditions which will produce and induce frequent short colds; chronic congestion ensues and paves the way for the inception of more serious disease.

In the Biological Section of the Meeting of the British Association at Bath in 1888, two Professors of Pathology from Cambridge read a joint paper on the 'Physiological Bearing of Waistbands and Stays'; their experiments showed what were the results of abdominal compression. In the discussion which took place, one of the speakers remarked: 'The authors of the paper had given a rational explanation of the cause of many of the diseases in women which baffled physicians. The pressure of the stays on the abdomen increased the work of the heart; that caused palpitation and shortness of breath. The blood being driven to the head accounted for giddiness, driven to the nose it produced redness, driven to the pelvic organs it accounted for congestion, driven to the legs it produced swollen ankles and varicose veins, driven out of the abdomen it accounted for indigestion.'

The above is a good summary of evils induced by interference with Nature; but there is no reason why women should not wear a garment, known as stays, analogous to a man's waistcoat, provided it be cut properly. The thin materials of which dresses are made require some stiff fabric beneath to show off the material. And, again, the natural figure of a woman if treated with judgment is far more charming than the hour-glass waist. No lovely or charming woman in the world ever had such a waist as fashion plates depict. Would Jupiter have sighed for Europa and assumed the shape of a sleek-coated bull to tempt the lovely daughter of Agenor to mount upon his back and stray whither she knew not, or would Antony have married Cleopatra, if either the one or the other had had such a waist? An abnormally small and wasp-like waist may be taken as the outward sign of ill-humour and a peevish disposi-

tion ; certainly it does not indicate the possession of good nature and good temper. Ladies should take warning ; if they wish to have graceful and captivating figures in declining years, they must avoid nipping in the waist in early youth, for the lower part of the trunk will obtrude if the floating ribs are pinched inwards. The result of age cannot be ignored and must be met by forethought in early youth.

Of greater consequence is limitation of the space for the heart's action. In early youth this organ lies higher than in the adult. By preventing the expansion of the lower intercostal spaces the heart is retained, as it were, in the position of childhood and its descent interfered with ; in the adult female the heart lies higher than in the male, so that to obtain a waist the vertical diameter of the chest is reduced, and the lateral compression of the lower half of the ribs causes the chest-wall to encroach upon the heart's space : this is probably one of the causes of the fainting fits to which women are so subject. A stout kitchen-maid, aged sixteen, recently under my care, complained of fainting in her household work. The fainting-fits did not recur when the stays were worn looser. This is one of many cases. Cases of women dying in the streets, or even on the stage, attributed to tight-lacing, are often recorded in the daily papers. In working men who wear abdominal belts the heart is to some extent raised, whilst lateral compression of the inferior and true ribs is avoided.

The use of waist-belts by men is to enable them to raise or move heavy weights, but in supporting their backs they rupture weaker parts of the trunk which are unprotected. If a man is physically incapable with the mechanical powers supplied him by Nature to perform work without such aid, it is surely improper to support one part of the body at the expense of another.

In latent or undefined rheumatism we find *malaise*, palpitation, and tenderness between the ribs of frequent occurrence ; the persons in whom this assemblage of symptoms is chiefly

found are young boys and girls at puberty, and women. Joints subjected to injury are prone to rheumatic disorders. The heart may be regarded as the first joint in the body—certainly it is the oldest organ which exhibits movement; and as the ratio of rheumatic affections of the heart in women is greater than in men, the inference would seem to be that unyielding apparatus about the chest-wall is unadvisable.

There is, however, another factor which may account in some degree for the increased prevalence of rheumatic disorder. At puberty the heart is said to double itself in size. Between seven and fourteen years the annual increase in size is only 8 per cent., while during the development of puberty there is an increase of 80 to 100 per cent. When the changes of puberty are accomplished in one year, the heart doubles itself in size that year. If the changes are spread over two years, the annual growth is 50 per cent., if over five years 22 per cent., so that at puberty doubling of the heart in size takes place. Hence, left breast-pain in boys and girls, with difficulty of breathing on exertion, is satisfactorily accounted for. We infer, therefore, that tight clothing for young people of both sexes at puberty is injurious, and drill-instructors should be cautioned to avoid prolonged gymnastics.

At puberty there are two opposite conditions of body more marked in girls than in boys, each being a predisposing cause of consumption. The same age does not always represent the same degree of growth or perfection of function, so that it is possible to foster an 'undue vulnerability' of the tissues by adopting a style of dress which lessens 'the most favourable conditions of life' by imposing restraint on the action of the lungs and the heart, and impairing the circulation through the liver. In these cases there is a want of coagulability in the blood, and the lining membrane of the bloodvessels loses its polish. Weighty garments gathered round the hips interfere with the even rise and fall of the ventral viscera, and depress the vital powers by increasing muscular exertion; for

every ounce of unnecessary weight wrongly applied, when the body is expanding, imperceptibly adds to this muscular exertion. Habits of inactivity are fostered and mental disorders probably induced. Children before puberty run gaily about in short clothes, but at this time their motions become staid and slow, being tied, as it were, to the ground by the garments of womanhood.

On the other hand, bloodlessness at puberty may arise from the sudden expansion and growth of the body, incommensurate with a sufficiency of circulating fluid of proper quality to fill the bloodvessels. The system is underfed, and this want in the body is shown by the ravenous appetite of the young, and also the increased desire for rest and sleep. It is the time, likewise, when the young are surrounded by the evils of tuition and dress. The intellect is excited, to the neglect of body culture, and vanity is engendered by the growth of long hair and a woman's long clothes. The interior coats of various viscera are robbed of their proper share of blood, shown in the absence or change in quality of natural secretions, and in the bloodlessness of the gums, palate, and other parts. The vocal cords and lungs are sympathetic in the feeble and squeaky tones emitted. There is a want of vigour in the interior coat of the lung tubes to repel the injurious effect of impure air; these tubes are compelled, as it were, to accept any lowly organisms which arrive capable of thriving upon an impoverished membrane, in place of being digested or blighted by a healthy vitality.

The liver, the largest organ in the trunk, is injuriously affected by tight-lacing or tight bands round the waist; it may be forced upwards or downwards according to the seat of constriction. Sixty years ago stays were made with shoulder-straps and moderately constricted at the waist, but since these have been discarded the hour-glass shape of the stays has been increased to prevent them from slipping over the hips. Stays, which were intended for support, to show off the dress, and for

the suspension of other garments, have in this way degenerated into a moulding or modelling apparatus. The two floating ribs on each side are bent into the trunk, assuming an acute instead of an obtuse curve from the spinal column. Drawers, petticoats and skirts, are all tied round an artificial constriction of the body called the waist, and these must be tied so as to prevent them from slipping over the hips. In course of time these bands by their pressure cause deep fissures in the liver both in men and women. The fissures penetrate deeply and, thus, the substance of the liver is destroyed. The symptoms of this constriction are slowly and insidiously developed: there is derangement of digestion, loss of appetite, distension and tightness at the pit of the stomach, flatulence, alternate constipation and diarrhœa; sooner or later defective blood-making and nutrition. Such, in a few words, is the effect of tight bands. Women meet the difficulty by living as immortals on ambrosia and nectar!

Gall-stones in women occur in the ratio of three to two in men, and are attributed to the sedentary habits of the former over the latter; but possibly the increase may depend more upon local than general derangement, since the development of concretions is favoured by those changes which interfere with their excretion.

Chronic ulcer of the stomach is another disease to which females are very liable. It is not uncommon to find after death a groove extending along the stomach continuous with a similar groove on the liver. This groove corresponds to the left ribs, and is caused by pressure through *tight-lacing or bands*. It was found in 32 to 36 per cent. in women over forty years of age; in 7 per cent. in men. Ulcer of the stomach according to this view arises from pressure.

Whatever the evils of stays may be, the habit of tying tight bands round the waist is vastly more dangerous, because it finally prevents any movement among the pelvic viscera which might have escaped the stays. To recapitulate: waistbands

firmly tie down the lower ribs upon the liver, stomach and spleen, and the gentle compression exerted by respiration on the viscera, situated within the hip-bones and riding easily in their natural positions, is hindered. From this practice, besides displacements, there is loss of tone in the muscles of the trunk-walls and intestines.

There are, moreover, other conditions than those briefly alluded to, both of a general and special nature, which are traceable to faulty habits of life and methods of clothing.

SECTION III.

To rectify this unequal distribution of clothing, a portion of the costume used by Amazons, Greeks and Britons may be combined, and woman still preserve her warlike character under the guise of peace. Unknown to the outer world many ladies eschew 'the wasp-like waists of the dames and demoiselles of the period' and make fashion conform to Nature. In place of the creasy stuff used by the Greeks next to the skin, they adopt a merino vest fitting round the neck with short sleeves. The working classes, who use and retain this garment at night, partly on account of the trouble of removal, lose some of its protective day-value, whereas if it were made to open two-thirds of its length it would easily be withdrawn. The 'sherte' or 'camise' used by both sexes among the Saxons is retained; when combined with pantaloons, it can be confined by hose in place of being stuffed into the shoes. Over the vest the Greeks wore a tunic; this covered the chest and body, and was used with or without sleeves. It answers to the waistcoat of Henry VIII.'s reign; it may be made of woollen material of barrel shape fitting round the neck. The side-seams should be cut very slightly convex and sewn together, not concave and sewn together, as in the present stays. In the former case, rib-expansion is secured; in the latter, rib-compression. Woollen knickerbockers or trousers, thick or thin, according

to weather or climate, if required, could be attached to the tunic. Petticoats are articles of dress which should be reduced to a minimum ; they add to the bulk and weight around the hips, they produce heat and fatigue to the wearer in working or walking, and do not keep the extremities warm. A pair of flannel trousers or knickerbockers would rectify this condition, which is a matter of importance to the working classes ; these persons commonly have only a scanty clothing over the chest ; their clothing therefore is in the wrong place, but then they copy their leaders. Over all the gown or dress (the distinctive costume of every European woman under every circumstance). This should be made short as far as the ankle to avoid the dust of the road, and to afford the hosier and shoemaker scope for their skill ; whereas the dress as now worn to the heels cannot incite manufacturers to improve these articles of wear. Heavy skirts should be suspended by braces. The costume above described affords complete protection if suddenly intruded upon whilst dressing, overtaken by fire, shipwreck, or other accident ; there is nothing to encumber or interfere with the preservation of life, whilst modesty is preserved. If ladies who have not to work for their livelihood would take the trouble to instruct their poor neighbours in these principles, much disease would be avoided and decorum better observed.

Head-covering, gloves, socks and shoes are matters of comfort, and vary according to the climate and custom of a country. In the tropics head-dress varies from mud to straw or turbans, and felt. The Chinese and Japanese use straw hats in working costume, the better classes only fans or umbrellas for protection. In temperate climates head-dress is purely ornamental, answering to the Indian's tuft of feathers. 'Women both civilized and savage deck their heads with borrowed plumes and use gems which are hardly more brilliant than the naked skin and wattles of certain birds.' Men, however, were not to be outdone ; when they concealed

their love for head-dress, they, at the same time, displayed their sagacity and converted the skin of an intelligent animal into the monstrous shape of a chimney-pot. Gloves are useful for keeping the skin white and soft, for warmth and for hiding the effects of manual labour, malformation or other accident. Stockings and shoes with thick soles are essential, but in parts of Scotland and Ireland are not considered necessary amongst the working classes. A short time ago I heard a Scotchman lament that the luxury of stockings was creeping into his country.

In the last century the high heels of ladies' shoes were a great monstrosity. This custom has been somewhat revived within the last few years; it is injurious because it throws the weight of the body on to the toes. The centre of gravity is altered, and increased strain is placed upon those muscles, which would without fatigue maintain the body erect as provided by Nature. The Gorilla, Orang-outang, and other like tailless apes, walk on their toes, so it would seem that a reversion to the ancestral type is aimed at. This attempt, however, to imitate the 'wavy willow' has been made among the Chinese since the eleventh century, but an hereditary result has so far not been produced and there are signs that the custom is dying out. The injuriousness of this custom in the case of Europeans is accentuated by weighty petticoats, and must greatly enhance the fatigue of healthy exercise, to say nothing of results from accidents. Of late a fashion rivalling the Papuan or Hottentot—generally considered the lowest species of the human race, incapable of a true inner culture and higher mental development even under the most favourable conditions—has obtained. It consists in a hump at right angles to the lower end of the spinal column, designed apparently to enable European mothers to imitate other races, and so to carry more easily their offspring. Among the British this hump found no favour, it has gradually dwindled and will no longer be worth notice. But the Chinese boat-

women still strap their little ones on to their backs, the babies' heads bobbing backwards and forwards as the mothers ply their oars; whilst the Indian women put their children astride on one or other hip, mostly the left.

Fynes Moryson, in his 'Itinerary,' dated 1617, says of the Germans: 'The slovenly and naked Germans live in the same house with their beasts, and all generally, as well married as virgins, goe with bare legges, and I have seen a virgin in Saxony refuse a pair of silke stockings offered her of guift; and the maid-servants and married women of the inferior sort wear no shoes, except they goe out of the house, and great part go also abroad barefooted. The married women hide their naked feet with long gowns, but the maid-servants, wearing shorter gowns, gird them up about their hippes.' In Turkey 'the gowns of men and women little differ save that the men have them larger, the women close at the breast; the gowns are cut close to the lowest part of the neck and then made fast so as all the neck is naked. The Turkish women wear smockes, of which fashion also the men's shirtes are made; and a long cote of silke, wrought with needleworke and edged with sleeves close to the arms at the breast, with their necks naked. The women's gowns are much like those of men for cloth and fashion, open before so as the smocke is seen, and they weare linnen breeches, as men, by day and night. Seldom weare shoes or stockings like men, but buskins of light colour, adorned with gold and silver or with jewels.'

'In Ireland the English and English-Irish are attired after the English manner. Touching the mere or wild Irish, it may truly be said of them which of old was spoken of the Germans—namely, that they wander slovenly and naked, and lodge in the same house with their beasts. Gentlemen weare close breeches and stockings of the same piece of cloth of red or such light colour, and a loose coate and a cloake, or three-cornered mantell of coarse light stuff made at home, and their linnen is coarse and slovenly. Their wives weare a sluttish

gown fastened at the brest with a more sluttish mantell and more sluttish linnen. At Cork I have seen with these eyes young maidens starke naked grinding of corne with certaine stones to make cakes thereof, and striking off into the tub of meal such reliques thereof as stuck on their naked bodies.' He says: 'They abound in flocks of sheepe, the wool of which they are forbidden by law to export, so that the poor may be nourished by working it into cloth rugs and mantells generally worn by men and women.' Ireland also 'yields much flax, which the inhabitants work into yarne, and export the same in great quantity; and of old they had such plenty of linnen clothe as the wild Irish used to wear thirty or forty ells in a shirt, all gathered, and wrinkled, and washed in saffron, because they never put them off till they were worne out.' In another place he explains that saffron is an antidote to lice, 'and that nothing is more common among them than for the men and women to lie upon the green hills till they kill their lice with a strange nimbleness proper to the nation.' Saffron or some vegetable dye, as turmeric, may be the cause of the yellow robes of the Buddhist priests, who, having an aversion to sacrifice life, shave and use such vestments as will not create opportunity for interfering with their prejudices. If either saffron or turmeric be an antidote to lice, it might not be amiss for military authorities to consider seriously the question and prevent a repetition of what occurred to the army in the Crimea, and several times to myself on board ship with troops. 'For the rest the very chief of the Irish, as well men as women, go naked in very winter time, only having the hips covered with a rugge of linnen, and their bodies with a loose mantell.' 'And in such places they make a fire in the middle of the roome, the smoake whereof goeth out of a hole in the top thereof, and round about it they sleepe upon the ground without straw or other thing under them, lying all in a circle about the fire with their feet towards it. And their bodies being naked, they cover their heads and upper part with their

mantels, which they first make very wet, steeping them in water of purpose, for they finde that when their bodies have once warmed the wet mantels, the smoke of them keeps their bodies in temperate heate all the night following. An Italian friar coming of old into Ireland and seeing at Armagh this their dirt and nakednesse of the women is said to have cried out—

‘Civitas Armachana, Civitas vana
Carnes crudæ, mulieres nudæ.’
Vaine Armagh City, I did thee pity
Thy meates rawnesse and women’s nakednesse.

From these quotations the conditions and habits of several nations at a comparatively recent period—within three hundred years—are shown to be far removed from civilization as understood in London and Paris at this date; and the brusque, savage manners of some near neighbours are explained.

In equitation, *vivandières* of the French army, Punjabees, Turkish, and other Eastern women, ride as men. The side-saddle, which took the place of the pillion, was first introduced by Queen Anne, wife of Richard II. (1388); ever since then English ladies have thought it unfeminine to ride otherwise. But Queen Anne wore a high and long stiff bodice, a vast number of petticoats and a very long dress; she would have been horrified to wear trousers, a short habit and a man’s hat. On the other hand, no English woman at the present day could be found to sit on horseback without them; yet a European or American lady might adopt the common-sense of her less Christian neighbours, and ensure her safety whilst she saves her horse’s back. Since the time of Queen Anne ladies’ dress has completely changed, so that women can now ride the living horse, as they do the iron machine or bicycle, and this they do with far more grace than the other sex. If, then, this iron horse looks so well with a lady on its back, how would she not set off a long-tailed living horse in comparison with a fourteenth-century posture on a modern bob-tailed nag,

for the barbarous custom of docking horses' tails was unknown in those days. Fynes Moryson, in describing the Italian women at the time he wrote his 'Itinerary,' says: 'Also I have seen honourable women, as well married as virgins, ride by the highway in prince's trains apparelled like men, in a doublet close to the body, and large breeches open at the knees, after the Spanish fashion, both of carnation silke or sattan, and likewise riding astride like men upon horses or mules, but their heads were attired like women, with vain hairs knotted, or else covered with gold-netted caul, and a hat with a feather.'

In the dress of the ancients there is no interference with the form or functions of the body till Roman ladies adopted the *strophium*, the object of which in connection with gauze dresses, which covered but did not conceal the figure, is obvious. Stays of the olden times with shoulder-straps may have been of use to corpulent women, but the only use of the modern form is that of a petticoat peg; hence, support by the aid of shoulder-straps and pockets would be useful, and stay-makers become a class deserving of thanks.

Nations who have not adopted European or American costume retain the freedom of the ancients. The Kaffirs both men and women are unclothed, so that the body is allowed to develop in a natural way. The female frame among the Kaffirs before marriage is remarkably well developed, full of symmetry and strength, affording a fine specimen of the compactness and power of the human body. Early accustomed to labour in the open air and to eat very simple food, great strength is attained and the body able to bear the heaviest burdens. The children as well as the women will walk thirty or forty miles a day without difficulty.

'On the east coast of Patagonia,' says Mr. Darwin in his 'Voyage of the *Beagle*,' 'the natives [Fuegians] wore guanaco cloaks with the wool outside which they wear just thrown over their shoulders, leaving their persons as often exposed as

covered, the skin being of a dirty coppery-red colour. They were men about six feet high. One old man wore a fillet of feathers tied round his head which partly confined his black, coarse, tangled hair. His face covered by two broad transverse bars ; one painted bright red from ear to ear and included the upper lip ; the other white like chalk parallel and close to the first so that even the eyelids were covered. Demonstrations of friendship concluded by three hard slaps several times given me on the breast and back at the same time. He then bared his bosom for me to return the compliment, at which he was highly pleased.'

The guanaco or wild llama is the characteristic quadruped of the Patagonia plains, the South American representative of the camel of the East.

An Indian female wears her robe to expose the right arm and shoulder, whilst two-thirds of the left lower limb are uncovered and the feet are bare. The symmetry of the figure is appreciable ; the dress in harmony with a certain exposure is graceful and modest. The Japanese woman leaves only a V-shaped portion of her breast exposed ; the dress descends to the heels, she has a sash round the waist, and uses high-heeled shoes. The Chinese woman has wide trousers to the ankles, a tunic with wide sleeves to the middle of the calf, white stockings and thick shoes. These three forms of dress leave the body unfettered and the limbs free. Of the three, the Chinese should be the most perfect. The Parisian fashion of accentuating—*more Romanorum*—that portion of the chest which should merge into the waist is not for the advantage of the sex because it is 'a custom fertile in disease and death.' The back, shoulders and arms with half the bosom exposed is nakedness without modesty. It is not beautiful, for the witchery of dress is absent. Duplicate hollows, prominences and angularities detract from that assemblage of properties which attracts and pleases the eye ; the impression of *oneness* is lost. The beauty of selected portions of the body is

enhanced by contrast: the half-clothed Indian is picturesque, not the completely naked, except in the rare cases of perfect symmetry. The unclothed upper half of an old Indian man or woman is positively repulsive, yet the same half clothed is not objectionable.

I may conclude this part of the section with an extract from a paper read by Mrs. E. M. King at the Nottingham meeting of the Social Science Congress in September, 1882: 'It may surprise many when I say that up to the present time women all over the world have been, and are essentially masculine characters; and that it is only in the Millennium of the future to which I look forward that they will become really feminine and truly womanly. With man the head of the family, man the chief of the tribe, man the ruler of the State, with man-made and man-administered laws, with man-made and man-administered Church, with all this pressure of man's influence and man's force around her from the cradle to the grave, how much of the pure unadulterated woman's character do you think can have grown up? She has been pressed into a mould shaped out by man, forced to grow to the shape which man thought woman ought to be. Just as some savages mould the heads of their children into the shape which they think the head ought to be.'

The lady who supplied the passage quoted above says: 'A charming lady down here, who is just a trifle stouter than she was, but only just properly covered, tells me her *fiancé* no longer admires her so much because he cannot span her waist with his two hands!'

From these remarks it is evident, that if women have erred somewhat in the fashion of their waists, it has been done through ignorance and for the purpose of pleasing their lords and masters—for in olden times women were little more than chattels, and in many places still are so. Now, these same lords of creation have been and still are pursuing an extravagance prejudicial to society. The women merely punish

themselves ; but men punish society in general by carrying about with them in their waving beards and whiskers disease-germs, which they scatter as the sower sows his seed.

There is little to be said on the dress of men ; it is not easy to make any suggestion worth adopting, for the ancients have settled the fashion. Trousers, trossers, or *truis*,* have been a national costume for over a thousand years : they are of the same advantage to men in hiding spindle-shanks as long skirts are to women content with bare feet or slatternly shoes ; yet knickerbockers with variegated hose confer a freedom and comfort not to be compared with the former. The broad-brimmed flat hat described on page 22—one, such as Mr. Punch invariably represents John Bull as wearing—might displace the tall chimney-pot hat and when not in use be allowed to hang over the shoulders as a convenient method of carriage. The evening dress-coat in its present form would be better left for waiters and the like, or else these latter clothed in a short white or gray blouse ; this would be distinctive and more serviceable than their present attire.

The dress of ecclesiastics in ancient Egypt and Assyria was, as is seen in statuary and frescoes, a long gown, still retained officially even in England, but always worn by the Romish clergy abroad. Buddhist priests officially use an elaborately-worked yellow robe. One friendly fellow on the borders of Thibet offered me his for a consideration, but divers reasons forbade the acquisition. In undress he wraps a yellow sheet around his shaven person.

This sanitary habit of the Buddhist priests might with advantage be adopted by clergy of other denominations, who in too many cases either ape a military custom or fall back on the slovenly appearance depicted in pictures of 'Robinson Crusoe and Man Friday.' But surely, on sanitary grounds alone, professional men and others who do not wish to shave might shorten their hirsute appendages, and avoid being carriers of infection.

* *Truis* is the old form ; *trews* is modern.

The custom of shaving is of considerable antiquity ; it was in use among the Egyptians fourteen hundred years before the present era. An illustration of the barber and his customer is given by M. Maspéro in 'Ancient Egypt and Assyria.' Eight centuries later Ezekiel writes : 'Son of man, take thee a sharp knife, take thee a barber's razor, and cause it to pass upon thine head and upon thy beard.' The Greeks in the fifth and the Romans in the third century also employed barbers. Alexander the Great directed his troops to be shaven to avoid giving the enemy an advantage by the beard. Again, it is said by Pliny that Scipio Africanus shaved daily. If so renowned a warrior as Alexander could consider the welfare of his troops ; and so ardent a soldier as Scipio appreciated the advantage of an appearance of smartness, cleanliness and comfort on service ; surely men, living nearly twenty centuries later, with increased sanitary and scientific knowledge at their command, need not adopt practices out of keeping with modern dress and civilization, and at variance with Oriental costume and mode of thought. Beards, however, are a protection from cold to persons scantily clothed : and when the population of the world two or three thousand years ago was sparse and scattered, beards were a necessity because every man had to arrange for his preservation. Grayness of the beard coincided with the fulness of a knowledge of life, which had arisen from the cultivation of the faculties of observation and reflection, and entitled the wearer to be deemed, not only venerable, but also wise. It was not, therefore, vanity which led the ancient old men to use beards, but a physical necessity and an acceptance of nature's bounty for warmth. The Chinese only acquire a beard in old age. But this does not excuse modern imitators, who mistake hirsute acquisitions for mental cultivation. In fact, these make haste to be wise and earn the phrase, '*imitatores servile pecus.*'

Sanitary officers find great difficulty in bringing home to the masses the advantage and absolute necessity of personal sanitation, but are they supported by the educated classes ? Example

is said to be better than precept, therefore the only effective support these can give is that of example. Now, the upper classes must know very well that everything they do is criticised, copied more or less, by those immediately surrounding them, so that habits, manners, customs and modes of thought, percolate the community from the highest to the lowest member. But each member is a pattern to his neighbour ; and the highest is he who performs his part best, not he who fills the most exalted position. The community then expects to find in persons of culture and position an intelligence which shall guide their appearances, movements and words, but not a servile imitation of all that tends unconsciously to slovenliness and return to savage life. When the eye becomes habituated to slovenliness, then progress in humanity is arrested.

The cottager who takes pride in his home, in being cleanly shaved and his hair trimmed, though coat and trousers may be patched, yet he is not slovenly, for his wife is thrifty, the house tidy, and the children well brought up. The force of example can here be traced : and it is for the educated to be themselves more trim for such cases to be multiplied. On the other hand, the cottager who takes no pride in home or person with his hair, beard, and whiskers unkempt, shows indifference towards the community, and a low state of morality ; his wife, too, is untidy, and the children uncared for. Thus masters careless in their habits, and indifferent to the appearance of themselves and their servants ; and mistresses, whose long skirts and petticoats trail in the dirt because it is fashionable, are responsible for this state of misery. Yet these trailing skirts are not more unsanitary than are unkempt hair, whiskers, and beards of the opposite sex—the homes of every stale and unsanitary scent pervading the atmosphere. Example, then, is better than precept.

When Mohammedanism became a power, beards rose in estimation, because the Prophet wore one ; further, the beard

was looked on as a mark of manhood and dignity. But modern imitators grow beards from laziness or to gratify their vanity, in order to exhibit their pre-eminence over the sex they treat as slaves. Thus, by an aspect of venerability and affected sanctity of character they preyed and prey on their fellow-creatures. Had it not been for vanity, the characteristic of man, Absalom might have had a noble ending.

Military dress and accoutrements may be left in the hands of the medical and military authorities. In the interest of the private soldier* one suggestion is worth making, namely, the substitution of the ornamental Tam-o'-Shanter for the useless Glengarry—a most unbecoming head-dress. In the former the poor man has a covering for his head in the bivouac, a shade in rifle-practice, and protection from the noon-day sun ; whereas the latter has none of these advantages, but seems best fitted for a water-scoop. Were the military authorities to sanction a Tam-o'-Shanter, a new industry would be created for the British soldier. Instead of being the idle fellow he is described, he would be one of the most industrious and harmonious, knitting caps or even socks while singing patriotic songs all the live-long day.

THE END.

