specula of bone that had wounded the lung, writes that "it happened at that time when the Emperor's daughter passed the narrow seas to marry with Philip of Spain (A.D. 1570), I serving then in one of her Majesty's ships called the *Aide*,"....."there was not at that time any physician in the navy to aide and assist me in this cure."

It has been shown that two years later (A.D. 1572) the College of Physicians began to raise the question against the practice of medicine by surgeons; and subsequently physicians afloat are referred to. Thus, in Cott. MSS., Otho, E ix, p. 235, among the expenses of an expedition that sailed from Plymouth under Sir Francis Drake and Sir John Norris (1589), we find an item "For sundry provisions for physick and surgery, with money imprested to *physicians and surgeons entertained*, £253:1:0." And in A.D. 1596, in the great expedition to Spain under Essex and Raleigh, Dr. Henry Atkins, Censor of the College, sailed as physician; but, suffering from sea-sickness, he returned from Plymouth, and Dr. Moundeford succeeded him. It is not clear, however, with which of the sister services they were connected; and the same reservation must be held with regard to the following list of Fellows of the College of Physicians employed in the Civil Wars; but it is almost beyond a doubt that in the reign of Charles I, Dr. William Harvey, Sir Thomas Caddyman, Sir John Hinton, Dr. Hamey, Dr. Goddard, Dr. Hawley, Dr. E. Dawson, and Dr. Charlton, appear to have served in the army; and under the Commonwealth and Protectorate, Dr. Paul Delaune, Dr. Nathaniel Chamberlaine, Dr. Sheaffe, and Dr. Cox, in both services.

It may be asserted from the foregoing data, that at the end of Queen Elizabeth's reign there were physicians as well as surgeons employed in our armies and fleets. The pay of a physician was 5s. per day; that of a surgeon in the army was 1s. 6d., the same as trumpeters and guidons (heralds); a surgeon in the navy does not appear to have been paid more than the chaplain, or the same as seamen, *i.e.*, 10s. a month. As the same persons were employed—like Clowes, for instance—sometimes in the army and sometimes in the navy, there must have been some means of equalising the emoluments of the twin services. It may have been that in the navy the gratuity of 2d. a month being deducted from the seamen's pay was certain, while in the army it was a personal payment, and therefore less certain. Again, in the navy, there was a monetary margin at disposal of the captains of ships under the designation "dead pays," or additional wages charged for men not on board, as perquisites in augmentation of wages to others. Of this we learn, from the Report of the Navy Commission in 1628 Charles I, that there was a "dead pay" on each ship in commission for each of the principal officers of the Navy Board; that admirals in command had twelve "dead pays", and captains eight, being wages of so many fictitious seamen for the payment of their retinues. Now it seems possible that, when captains had the appointing of surgeons to their ships, they may have supplemented their daily pay out of the "dead pay" allowance. But, besides this, it is probable that each surgeon received, by rule or custom, a "dead pay," as the same report allows the surgeon of the ordinary at Chatham £13:6:8 *per annum*, about 9d. a day, for all allowances, explaining—"To Chirurgion, etc., we add nothing but make their wages, rateable to that they have before. Onlie wee now shewe their faces, which then were but shadowed in 'dead payes'."

On this ground, I consider that all chirurgions of the extraordinary, or in commission, had at that time a perquisite on the "dead pay" list of the ship to which each belonged, which, together with the victuals, to which all on board ship were entitled *free*, made the emoluments of the navy-surgeon equal to those of the surgeon of the army. There would appear, according to that report of commission, to have been no changes in the pay of the navy between the days of Elizabeth and Charles I.

In the British Museum Collection, Add. MSS., there is an interesting document, No. 9301, fol. 6-7, from the principal officer of the navy to Captain John Pennington, concerning Peter Holloway, chirurgion of the *Isaac* of Ipswich, who was unfit in regard of health for further service at sea, and the only son of a widow, who was dependent on him, and had solicited his discharge. "To which request, in regard she hath no more children to help and comfort her, wee are the rather willing to condescend, and therefore intreate you to cause the said P. H. to be discharged and to *press* another in his roome, and so wee bid you farewell. Your loving friends." (With five signatures). This letter typifies well the condition of medical officers in the navy within one month of the death of James I, when preparing an expedition under Buckingham against Spain, and surgeons were to be obtained by impressment only, which was carried out by the hand of the Barber-Surgeons' Company.

[To be continued.]

ON THE VARIOUS PREPARATIONS OF KOUMISS AND THEIR USE IN MEDICINE.

By V. A. JAGIELSKI, M.D. Berlin,
Late Physician in the Prussian Army, etc.

THOUGH authorities may differ on other points of the subject, they all unite in the opinion that chronic diseases, and especially those of a consumptive or emaciating nature, are developed by antihygienic influences. Logically, then, to combat these diseases, and to cure them, particularly in their early stages, they must be treated with means which will correct or arrest the morbid impulse. Primarily, the atmospheric conditions which surround the patient ought to be suitably chosen; and secondly, but no less urgently, the diet must be so regulated, if possible, as to act the part of both "physic and food". In this relation, the practice of medicine is becoming more and more distinguished, in both its "science and humanity", by the importance which it now gives to dietetic remedies in therapeutics. We have in them facilities for the physiological and chemical treatment of certain obstinate diseases that resist purely remedial agents, and they are real handmaids of the greatest service to the practitioner. Chief of these remedies, and indeed epitomising them, is the milk of animals, because in its composition it comprises all the nutritive requirements of the body. Yet, perfect as milk is in all the elements of a facile alimentation, disease has oftentimes so enfeebled the digestive powers, that even it cannot be assimilated in sufficient quantity to maintain healthy life. Fortunately, however, there is a chemical sensitiveness in milk, which predisposes it to such physical and internal changes as will enable it to accomplish the prompt and perfect nutrition of the organism by overcoming the pathological obstacles. We have an example of this in the koumiss of the Tartars, which is fermenting mare's milk. Its magic effects are manifested in the robust constitution and the complexions of the nomadic people of the Russian Asiatic steppes, who during the warmer season live exclusively upon it, to recruit the health and strength which they have lost through the privations and exposures of the previous winter.

That milk will undergo vinous fermentation, and yield a certain quantity of alcohol, is not generally known. Every educated person, however, has heard that the Tartars drink the milk of their mares in a state of fermentation, called koumiss. Samara and Orenburg were the first places which were chosen for a resort of cure in chronic chest-diseases. To Dr. Stahlberg belongs the great merit of inducing the Russian Government to assist him in opening the first koumiss institution in Moscow, and afterwards in Tsarskoe Silo near Petersburg, the milk of mares being used which were expressly imported from the Tartar steppes; and it is from Vienna that we have heard recently of the great success of koumiss, introduced again by Dr. Stahlberg.

The milk of all animals is convertible into koumiss by one and the same method; but, as the several milks differ among themselves in the quantitative relation of their components, so also will there be corresponding variations in the koumiss which is produced from them. Qualitatively, however, the koumiss from different kinds of milk may be considered uniform, as has been shown in my special work on koumiss published in 1870, and in my paper in the *Milk Journal*, April 1871. More immediately in connexion with this paper, however, I present the analytical results of Wanklyn, obtained from cow's milk *medium koumiss*. A quart bottle of this medium or B koumiss* (manufactured in London by E. Chapman and Co.), which holds about 12,000 grains of koumiss, contains as follows. (It was examined when twelve days old; specific gravity, at 62 deg. Fahr., 10.28.)

Water	10,662 grains
Alcohol	192 "
Caseine and Albumen	128 "
Lactose	582 "
Lactic Acid	130 "
Fat	36 "
Ash	90 "
Carbonic Acid	180 "

12,000

The 90 grains of ash contain, approximately, 60 grains of phosphate of lime and 30 grains of mixed chlorides of sodium and potassium.

The three gradations of koumiss, designated as Nos. 1, 2, and 3, represent the irrepressible changes which it undergoes in time, while fermentation continues in the bottles. In the process of conversion of

* This analysis is not contained in J. A. Wanklyn's book on *Milk Analysis*, published by Trübner and Co., 1874, which gives only "Full" Koumiss tables.

the milk into koumiss, the following changes take place. By the interaction which is promoted, caseine is set free in a highly attenuated molecular condition. The lactose is partially converted into alcohol, carbonic and lactic acids; and incidentally a bouquet of fragrant volatile products is generated (according to Morfit), which may perhaps be regarded as adjuvant in the remedial effect of the koumiss. The fermentation, once started, will continue, no matter how cold the temperature, or how closely the koumiss may be corked in bottles. Thus the products arise in time from the minimum in No. 1 to the maximum in No. 3. In passing through these gradations, the koumiss retains all its general properties, but changes some of its specific adaptations, as will be explained directly. In all cases, the koumiss is a milk-like fluid. In its fresh No. 1 state, it is a still liquor, and has an agreeable sweetly acidulous taste, recording sweet almonds. As it approaches the No. 2 gradation, it becomes more acidulous, assumes a sparkling character, and requires to be drawn from the bottle through a special tap. In No. 3, the sweet taste is replaced wholly by the acidulous, which also has sometimes a slight shade of bitterness; and the koumiss not only sparkles, but rushes through the tap in a rich creamy foam. These changes progress so rapidly in warm weather, that the bottles should be kept in a cold cellar, and treated with the same care as champagne wine. The distinctive character of koumiss is that of being the most assimilable of nutriments. Every quart bottle contains, approximately, 970 grains of solid respiratory and plastic food, according to Wanklyn; and each of its elements is in a state to promote digestion of the others by the feeblest stomach.

The original koumiss of the Tartars is made from mare's milk; but, in my judgment, cow's milk is an equally good raw material, if not better; and there is no doubt that this koumiss gives highly successful results in proper cases, as shown here, in Odessa, Warsaw, Cracow, etc. It is not thin, like mare's milk; and, besides, it gives a koumiss free from every disagreeable odour and taste. Moreover, cow's milk, by its composition, affords facility for varying the composition and consistence of the koumiss-product according to the indications of particular cases. This is an important consideration, as through its means the chemist is enabled by his proper skill to make full koumiss, pure whey koumiss, medium koumiss, and extra kinds of special composition for special diseases, like diabetic koumiss, etc.

The physical and chemical characteristics of koumiss render it an aid upon which we can rely with great confidence for the treatment of extreme debility and all the phases of impending marasmus. A long and favourable experience justifies me in giving an emphatic assurance on this point. Koumiss not only contains a large proportion of lactic acid, which is a prime constituent of the gastric juice, but holds the caseine in that state of vitality which gives it the property of metamorphosing itself and the other constituents of the milk into healthy lymph and blood.

The physiological features of the several constituents of koumiss may shortly be specified as follows.

The *lactic acid* activates the digestive powers, diminishes the temperature and the frequency of the pulse, and regulates the mucous secretion. It has an additional specific action in certain diseases, as, for instance, in diabetes.

The *caseine*, *albumen*, and *fat*, restore the plastic and heat-giving materials of the body, and act as a chemical inspiration, so to speak, to promote assimilation of its associate constituents.

The *lactose* increases the weight of the body, and gives heat.

The *alcohol* produces sleep, diminishes heat, and forms fat.

The *carbonic acid* allays nausea, calms gastric irritation, augments diuresis, increases the energy of the heart's impulse, and diminishes the frequency of the heart's contractions.

As to the more minute acids and fragrant compounds, I prefer not to speak until my experience and observations in regard to them have become more mature.

It will thus be seen that the process of double fermentation in the artificial preparation of cow's koumiss has done nearly all the preliminary work which would fall otherwise on the digestive organs. There is no other derivative of milk or any other substance which can be substituted for it with corresponding advantages, for it may constitute a sole diet, as my own experience has proved, in many cases of chronic dyspepsia both simple and complicated. Dr. Braczinski of Berlin speaks, in his monograph, of koumiss from cow's milk as one of the most valuable aids in the medical practice of Warsaw; and Dr. Neugebauer of Warsaw makes a special mention of a case, in his private practice, of a young nobleman, presenting all the symptoms of *tabes dorsalis*, which was entirely cured in six weeks by treatment with cow's milk koumiss. This confirms my own experience with a mild case of a similar kind. Dr. Küttner, in Dresden, has also reported to me many gratifying results which he has obtained with koumiss in dyspepsia and

debility. Dr. With of Brunerhaven writes in strong favour of fresh koumiss for all catarrhal diseases of the stomach, bowels, lungs, and in anæmia. In Dr. Kwasnicki's Polish translation of my treatise on koumiss (1870), there is a note which records Dr. Nowakowski's and Dr. Przysanski's confirmation of my own experience in the use of cow's koumiss. An appendix to the same translation gives the clinical experience of Professor Chalubinski at the University of Medicine in Warsaw, which prompts him to recommend earnestly the use of cow's koumiss in catarrhal disease of the mucous membranes, of the gastrointestinal and respiratory tracts, and in debility from whatever cause. Dr. Edward Charlton, the late Surgeon-Major Ross, and Dr. R. Dawson, have also written to me in praise of koumiss as a valuable dietetic remedy; and Dr. Campbell Morfit, of the U.S.A., found, in his own case, that the British koumiss acts with the most decided benefit in catarrhal diseases and obstinate constipation, and increases weight rapidly. Mr. Ceely of Aylesbury, and many other brethren in this country, share the same opinion as those whose families I had the pleasure of advising. Nefel, Stahlberg, Schnepf, Marra, Weinberg, etc., have contributed largely to the medical literature of this subject, which has in the last few years increased considerably, as I presently count over thirty authors, who all agree on the main points of therapeutical success of koumiss, from whatever milk it may have been prepared. I will not prolong this paper by enumerating the cases reported in those works, as I shall arrange them in a proper order in the second edition of my treatise on koumiss; but so much I must say, that all these authors confirm the brilliant therapeutical results described so well by the father of koumiss literature, Dr. John Grieve of Edinburgh, late physician to the Russian army, when his paper, written with emphasis and with an undeniable noble feeling throughout, was read by Dr. Black, July 12th, 1784, in Edinburgh, regretting that koumiss should still remain unknown in the most enlightened parts of Europe, although a horde of Tartars, etc., had been using it for some ages past. I only do my duty in paying the greatest possible respect to the memory of Dr. Grieve, because even to-day his correct conceptions, his skilled judgment, his well defined indications, have not found a better and nobler expression on this subject after the lapse of almost a century, and I willingly endorse Virchow's words: "I have two faults over which I rejoice conscientiously; the one, that I consider the old physicians as 'brave' observers, and perhaps the still greater one of believing in their therapeutics."

Passing on to the indications of koumiss, I purposely omit to speak more specially of its physiological effects, which can only be understood by the full knowledge of its separate ingredients, and the operation of each; involving investigations that belong rather to a separate work, including the cumulative effects or sum total of the effects of koumiss.

Full Koumiss (A) is made from cow's milk, preserving the whole of the cheesy matter and as much of the butter or cream as is compatible with digestion and manufacture. It is adapted for cases of great emaciation with weakness of the digestive organs, when little liquid and no solid food can be taken; also for all complaints which are not of a febrile character, the bodily temperature especially not exceeding 100 deg. Fahr.; and for patients who have previously improved under the use of *Medium Koumiss* (B). This is the artificial representant, as nearly as possible, of the mare's milk koumiss, not obtainable in this country; and can be made by mixing ass's milk with cow's milk in the proper proportions, or by adjusting the natural components of cow's milk alone, so as to diminish the caseine and butter and augment the lactose and salts, thus making the koumiss more facile of digestion. It is suited to delicate or sensitive stomachs, which revolt against the buttermilk taste of the full or A koumiss, in which the cheesy matter proves too rich; and is also a more sensitive koumiss of more agreeable taste, so as even to satisfy a very capricious palate. Should there be in some exceptional cases a dislike even to the B koumiss, then I would prescribe, especially for children or ladies, whey or C *Koumiss*, No. 2 or 3, mixed with one-third part of fresh milk, warmed, if wanted, at the time of drinking, to be taken at first in small doses frequently during the day (one pint bottle *per diem*), increasing every two days *usque ad libitum* (three or four pints and more per day). Some persons, again, will prefer a little sugar dissolved in a tablespoonful of warm water put first into the tumbler, then the fresh milk, and on this let the koumiss out with all its force to mix thoroughly. A small quantity of champagne wine with it will augment the alcohol in a very pleasant way, if necessary.

The specific gravity of B koumiss varies between 1035 and 1070 in its fresh state, though, by the process of fermentation, it may sink below 1028 in consequence of the lactose breaking up into lactic and carbonic acids and alcohol. It may be used for diseases of the stomach and lungs instead of solid food, especially when the patient frequently asks for an acidulous drink, which in this case will not raise the temperature or irritate the stomach by a too sudden ingestion of solid matter. In this

koumiss it is also found that, in the second stage of fermentation, the cheesy matter appears in separate layers, which, however, by shaking, can be easily reduced to a homogeneous milky fluid by combining with the serous layers, and the molecular condition is then so uniform that no flakes are noticeable, as in the genuine mare's milk koumiss. I may notice here that cheesy matter in the solid form, separated from the milk by means of rennet, curds, etc., is quite indigestible, even in small quantities, and can only be adopted for food when fermented in the shape of Stilton or Cheshire cheeses, etc., which are prepared, with or without the addition of cream, all over the globe; whereas, in a well fermented koumiss, the cheesy matter appears as a homogeneous, soft mass, which constantly develops bubbles as long as it is moist, and the flakes dissolve on the tongue like snow, with an acidulous and a pleasant sensation. No wonder, then, that it does not give the stomach the slightest trouble in digestion or absorption; and I can safely say that I have never found any other form of cheesy matter, by any course of preparation, that possessed similar properties, although I have made innumerable attempts to produce a soft cheese which would prove digestible in larger quantities, so as to replace loss of flesh in certain wasting diseases. In my experiments, I found that the dry residue of koumiss, after filtration or evaporation, affords a granular mass of acidulous taste, containing undecomposed lactose, albumen, and salts, which, when made into lozenges with the necessary additions, are so easy of digestion, that a few of my friends consumed nearly a pound of them after dinner—*pour la bonne bouche et digestion!* I would not seem, however, to recommend A koumiss after a hearty meal, though I shall never forget Plymouth, where, after reading my paper on koumiss, a very eminent gentleman contended in sober earnest that, having taken some of Chapman's Full Koumiss in the museum, for the supposed purpose of removing indigestion after a full breakfast that had disagreed with him, instead of feeling better he became worse, as if "a plenus venter digerat libenter" when it becomes still more extended.

I have been often called upon to answer most amusing questions with regard to koumiss, though I must confess I correct with the greatest pleasure the errors committed by others on the subject of milk-fermentation. Many look upon koumiss as a drug-medicine, and think that with one or two bottles, taking a tablespoonful every two hours, a decided effect ought to follow; just as some persons fancied that guano, when first introduced, would make plants grow *ad oculos demonstrandum* (before their own eyes!). I regret that the age of wonders has passed, although there is still a credulous portion of humanity to conjure up wonders in their own imagination. Koumiss is, however, undoubtedly entitled to be regarded as a medicine that "heals to nourish, and, in nourishing, gives strength and weight in the shortest possible time;" which is a truth daily confirmed in proper cases. In any case, this remedy is, at all events, harmless, occasioning no anxiety to the physician, and much more likely to produce the good effect he desires, especially in cases where drug-treatment is apt to fail. I ought to state that I never had the opportunity of procuring a sufficiently large quantity of mare's milk for koumiss, so as to make fair trial of it in practice; and my conclusions as to the comparative merits of mare's and cow's milk koumiss are strictly of a deductive nature, based on the analysis.

REMARKS ON ICHTHYOSIS LINGUÆ FOLLOWED BY EPITHELIOMA LINGUÆ: WITH NOTES OF THREE CASES.

By HENRY MORRIS, M.A., F.R.C.S.,

Lecturer on Anatomy at, and Senior Assistant-Surgeon to, the Middlesex Hospital.

IN patients suffering from epithelioma of the tongue, it is not so rare a thing as is sometimes represented to find the mucous membrane of the tongue or cheeks, or both, covered by white leathery or cornified patches of thickened epithelium, with or without distinct naked-eye appearances of enlargement of the papillæ. This condition was called, first, I believe, by my colleague Mr. Hulke, ichthyosis glossæ; and, at the time when he communicated the report of a case to the Royal Medical and Chirurgical Society in 1864, Sir James Paget narrated an account of a case in his private practice, of a lady who, some years after the occurrence of ichthyosis, became the victim of epithelioma of the tongue. This case of Paget's was the first recorded notice of the association of ichthyosis and epithelioma; and Mr. Hulke's paper contained, so far as I know, the first description of the nature of the morbid change which he had so named. Several isolated cases of ichthyosis have been since reported; but there can be no doubt that in many instances this condition of the mucous membrane has preceded or coexisted with epithelioma, without having

been ascertained from the history of the case, or paid attention to when seen. I am led to this opinion by the fact that, during a period of less than six months, three well marked cases of epithelioma supervening on ichthyosis linguæ have come under my notice in the cancer out-patient department of the Middlesex Hospital; because, too, I can bring to mind other cases in which I have seen such a change, and can refer to my notes for instances in which it is stated that there were "hard superficial patches on the dorsum", or that "the mucous membrane, from the lower surface of the tongue to the inner surface of the maxilla, is thickened and raised"; or, again, "the tongue is coated with a thick yellow fur".

No one who is familiar with Mr. Hulke's description of this abnormal state of the tongue in the second volume of the Clinical Society's *Transactions*, could fail to recognise the affection; but, though the condition is unmistakable, some objection has been raised to the term used by Mr. Hulke to express it. In a recent excellent monograph upon diseases of the tongue by Mr. Fairlie Clarke, exception is taken to the name ichthyosis, chiefly for the reason that in ichthyosis of the skin the sebaceous glands are concerned, whereas in the mucous membrane of the tongue there are no such glands. But that form of so-called ichthyosis of the skin in which the sebaceous glands are involved otherwise than by being simply occluded—just as, in very severe cases, the hair-follicles also are affected—is not true ichthyosis, but the seborrhoea sicca of Hebra. True ichthyosis is primarily and fundamentally a deviation from the natural state of the epithelial structure of the skin, although in severe cases it may be associated with a hypertrophy of the epithelial sheaths of the papillæ, and in still more severe cases with a hypertrophy of the cutis vera.

Another objection which has been raised to the name ichthyosis is, that this condition of the tongue is only a local one, and is not associated with a similar change in the mucous membrane of other parts or in the skin. But ichthyosis simplex or cornea may be local, and not general, as we sometimes see about the ankles, shins, and elbows; and, moreover, it is not correct to say that the mucous membrane of the tongue is in all cases the only part affected, for the mucous membrane of the cheeks and floor of the mouth are sometimes, though, so far as I have seen, to a less extent, affected also.

On the other hand, the reasons in favour of retaining the term ichthyosis for this state of the lingual and buccal mucous membrane are these. The morbid change is essentially a change in the epithelial layer of the mucous membrane, although sometimes attended with a hypertrophy of the sheaths of the papillæ, and sometimes with a hypertrophy of the basement-membrane, as in Mr. Hulke's case and in one of the cases described below. Again, in this condition of the tongue, as in ichthyosis of the skin, the surface is rough and leathery to the touch; the scales of epithelium are closely imbricated or matted together, and adhere firmly to the subjacent structures; the little furrows, which are more or less well marked, map out the scaly patches into little segments in a tessellated manner; and, though never disappearing altogether, the degree of change in the tongue, as in the skin, varies at different times. Further, the change in the tongue is due, no doubt, to an alteration in the nutrition of the part, and is not in any way dependent upon local irritation. In no one of the cases now reported was there the slightest ground for thinking that irritation had provoked the change. The positions upon which it occurred discountenanced such a hypothesis; whereas the fact mentioned in the report of Case II, that the patch varied in size and soreness with the state of health, favours the assumption that the condition is dependent, in some way, upon the processes of nutrition.

It is true that the tongue, from its situation, is continually exposed to considerable irritation; but this is all the more reason why we should require the cause and kind of irritation to be very definitely known before attributing a more or less general change in the structure of the lingual epithelium to such irritation.

It will be well to determine, for the sake of analogy, if the chemical constitution of the epithelial cells of the tongue affected with so-called ichthyosis is altered; and, if so, in what manner, and how far the changes correspond with those which have been proved to occur in ichthyosis of the skin. It would also be satisfactory to ascertain if, or to what extent, if at all, ichthyosis is hereditary. If it be found to be so in any marked degree, we shall have a further point of similarity between this change in the mucous membrane of the mouth and the ichthyosis of the skin.

With all the features of likeness above mentioned, there seems no more objection to apply a term used for this abnormality of the skin to the similar abnormality of the tongue, than there is to speak of the eruption of scarlatina or erysipelas as occurring in the throat.

The object, however, in view in publishing the subjoined cases, is not to employ them as a groundwork for the defence of a name; but,