body excepting the conjunctiva. So sensitive are the walls of the larynx, that the least alteration in the character or amount

Fig. 2.—Commencement of second stage of deglutition.

Fig. 3.—Termination of second stage of deglutition.

of the fluid which covers them is sufficient to produce irritation, and the smallest drop of saliva or any other fluid entering the upper orifice of the larynx immediately sets up a prolonged and violent attack of coughing. Now, the amount of mucus, saliva, etc., constantly present at the lower end of the pharynx is very considerable. Here collect practically all the secretions from the upper portions of the alimentary and respiratory tracks; from the mouth comes saliva from the various salivary glands, and mucus formed by the buccal glands, and the secretions of the faucial and lingual tonsils. From the nose and naso-pharynx comes mucus secreted in the many large accessory sinuses and by the pharyngeal tonsil, and also secretions from points so far away as the mastoid cells and the lachrymal gland. All these secretions collect in the pharynx, those from the buccal cavity running over the dorsum and sides of the tongue, those from the naso-pharynx flowing almost entirely down the posterior surface of the soft palate, and dropping from its edge or from the uvula upon the base of the tongue. Were it not for the epiglottis there can be no doubt that a large quantity of this secretion would find its way by the natural force of gravity directly into the larynx. The epiglottis is placed as a natural shield to the glottis, receiving the mucus and other secretions upon its convex anterior and upper surface, and deflecting them laterally into the two sloping pyriform fossae, by which they pass easily and readily into the oesophagus. This seems to be the natural and most important function of the epiglottis. In persons who have no epiglottis this function is not performed, and we find that they are troubled with huskiness and frequent desire to clear the throat. They also experience some difficulty in swallowing fluids, due, I think, to a small amount of fluid not being thrown into the oesophagus by the elevation, etc., of the tongue, as is a bolus of solid food, but trickling over the back of the tongue on to the sensitive aryteno-epiglottidean folds.

Whether the epiglottis exercises any important function in phonation is a question which seems to require further investigation. Sir Felix Semon⁶ has stated that "it had been shown that 'timbre' depended on the position of the epiglottis, and that in the production of the more open tones the epiglottis is more upright." Of course the epiglottis in common with every other part of the upper respiratory passages must have some effect upon the tone and resonance of the voice. So far as my observations go, a man with a strong voice generally has a large, well-developed epiglottis, but one of the most irregular epiglottides that I have seen belonged to a man who had attained some repute as a tenor soloist.

The views expressed in this paper may be summarized as follows:

That the only function performed by the epiglottis during deglutition is to act as a slight lateral protection to the glottis. That the main function of the epiglottis is to prevent the secretions of the upper air passages, etc., from entering the larynx when in a state of rest. By its means these secretions are deflected into the pyriform fossae, and so find their way into the oesophagus. The influence of the epiglottis over phonation is at present undetermined and uncertain.

I am pleased to have this opportunity of acknowledging my indebtedness to Dr. Alex. Hodgkinson for much advice during the preparation of this paper.

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AN ANALYSIS OF HUMAN CHYLE.

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My best thanks are due to my colleague, Professor Barling, who very kindly drew my attention to a case of accidental wound of the thoracic duct near its entrance into the veins, which occurred in his private practice, and from which he allowed fluid to be collected for analysis.

The patient, E. S., was a well-nourished and healthy girl of 10 years of age. The escape of lymph from the wound, copious at first, had begun by the time I was communicated with to diminish in quantity, and speedily ceased altogether.

I suggested that if possible a cannula should be placed in the duct itself, or if that were not possible owing to the small size of the puncture, that a large tube be inserted into the wound with its end as near the puncture in the duct as possible. This latter was found to be the only course, and was duly carried out. By this method two samples of fluid from the duct were collected free from blood and other impurities, and handed over to Mr. C. A. Lovatt Evans, of my laboratory, for analysis.

The amount collected in each case was small; the first sample consisted of only 5.5 c.cm. of milky lymph which exuded between 11 a.m. and 5 p.m., the child having eaten at least one meal during that period. On analysis this was found to consist of:

Water	...	...	92.12 per cent.	
Fat, lecithin, cholesterol	...	4.88	"	} total solids, 7.88 per cent.
Mineral salts, proteids, etc.	...	3.00	"	

The other sample consisted of the mixed chyle and lymph collected during the two and a-half succeeding days, after which all flow ceased. A more complete analysis of this sample was made as 17.5 c.cm. of fluid were obtained. The specific gravity of the fluid was 1017.1 at 17° C. The analysis in parts of 100 is as follows:

Water	...	92.519			
Fat, lecithin	...	2.820		} total organic solids, 7.051	
Cholesterol	...	3.840			
Proteid	...	0.391		} total solids, 7.481	
Fibrin and other organic substances	...	0.155	} total mineral matter, 0.430		
NaCl	...	0.275			
Other salts	...	0.275			

This differs in several respects from the table given by Munk and Rosenstein,¹ which they obtained by analysing the lymph of the thoracic duct in a case of fistula in a male of 18. Thus, the salts in the above table are only half as abundant as in that of Munk—that is, 0.4 as compared with 0.8 to 0.9; of these, the sodium chloride is only 0.15 as compared with 0.55 to 0.58. It would appear, therefore, that in the case of this child there was a deficiency of sodium chloride in the lymph. Again, the total amount of solids in Evans's table is far in excess of that in Munk's, being 7.051 as compared with 3.7 to 5.5. This, however, is easily accounted for by the excess of fats in the present case, due to a meal having been taken during the period of collection, whilst, in the case examined by Munk and Rosenstein, the fluid analysed was taken during a period of fasting.

When we examine the two tables a little more closely we find that the amount of proteid is practically the same in both cases—3.84, as compared with 3.4 to 4.1; if to the 3.84 is added the fibrin and other organic substances other than those soluble in ether, as is done in Munk's table, we get 4.231 as against 4.1. Therefore the difference in total solids between the two tables is due to the presence of fatty matters absorbed from the intestine in the case under consideration, they being 2.82 as compared with 0.04 to 0.1 in the fasting man. The only real difference between the two cases, therefore, lies in the inorganic constituents, chiefly of sodium chloride.

Hoppe-Seyler,² however, published one or more analyses of chyle in man which give results much nearer that of Evans as far as the inorganic constituents go; thus in one case he gives 0.44 and in another 0.625 as the total percentage of salts, which does not differ materially from 0.43 in Evans's analysis.

It would seem that this latter figure is a more usual one for the percentage of salts in human chyle than the higher figure given by Munk and Rosenstein.

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CONTAGIOUS GROWTHS IN DOGS.

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IN 1898, Washbourn and Bellingham Smith published two papers on some contagious tumours which are met with on the genital organs of dogs.¹ The history of their cases was, shortly, as follows: A dog served twelve bitches, of which eleven subsequently developed growths in the vulva. Another dog served three of these and then two healthy bitches, of which one became infected and the other escaped. The growths in each case appeared about one month after pupping; they were single or multiple, pedunculated or infiltrating. In no case was spontaneous cure observed. The authors inoculated a series of dogs with portions of the tumours, some subcutaneously and others on the genital organs. In one of the dogs inoculated subcutaneously the growths persisted until death, and there were metastatic deposits in the liver and spleen. In the other cases the growths, after attaining a maximum in about three months, spontaneously disappeared, and the animals were afterwards found to be immune. In only one case did a growth on the genital organs disappear spontaneously. The growths could not be transmitted to any animals except dogs.

I have had the opportunity of examining two similar cases, which present several points of interest. The animals affected were valuable pure-bred bulldogs. The history was as follows:

A bitch A was served by a dog C, which, on careful examination, appeared to be perfectly healthy. Shortly after pupping a growth appeared in the vagina,² and, five months later, a tumour was noticed in one of the mammary glands. The growth in the vagina and that in the mamma were removed simultaneously twelve months after the appearance of the vaginal growth. The bitch at the time of the operation was much wasted, but since that time has become healthy, and now, after an interval of three years and a-half, remains perfectly well. A second bitch B was served by the same dog C about four months after the bitch A. A growth appeared in the vagina shortly after pupping, and was removed thirteen months later. This bitch also remains perfectly well at the present time, three years and a-half after the removal of the growth. Both bitches have bred since the operation, each giving birth to two valuable litters.

The dog C served four other bitches, all of which were infected and died from the effects of the growths. One only pupped and her pups were very weakly. The bitch B was served by three other dogs. All of these developed growths and died from the effects. The dog C also died.

I examined the growths in the bitches A and B. In both cases the growth took the form of a warty condition of the vaginal mucous membrane involving the whole circumference for a distance of 1 in. to 1½ in.; it was confined to the mucous membrane and did not infiltrate the muscular coat. During life the growths bled on the slightest touch and were very tender. The growth in the mamma of the bitch A was encapsulated, and measured about 2½ in. long by 2 in. wide. Microscopically, the vaginal growths were found to consist of small, round cells, closely packed together, supported by a delicate lymphoid-like reticulum. The epithelium, though thin, was continuous over the surface of the growth. There was very little tendency to infiltrate the surrounding structures, the boundary of the growth being very sharp, but there was no capsule. In the specimen from the bitch A there could be seen in the wall of the vagina in the neighbourhood of the growth a lymphatic vessel, with what was apparently a minute nodule of growth in its wall. The mammary tumour in the bitch A was of the same histological structure, except that there was a considerable development of fibrous tissue, causing it to resemble a fibrosarcoma.

The operation in both cases consisted in the removal of the affected portion of the vagina, the healthy portion being subsequently sutured to the skin at the vulval orifice. Steps were taken to prevent subsequent contraction of the orifice.

What is the nature of these growths? Washbourn and Bellingham Smith in their second paper did not hesitate to call them sarcomata, and certainly their histological structure is identical with that of lymphosarcoma. They differ, how-