PHOTO 8. Case 3. Pte. D——. Final.

to serve again, he has been sent back to duty. The dental work was carried out by Capt. F. E. Sprawson, R.A.M.C.

The diagrams illustrating the operations were drawn by Henry Tonks (late Lieut., R.A.M.C.).

OZÆNA AMONG THE VARIOUS RACES OF THE EARTH.¹

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As we have had, through extensive travels during the last ten years, the opportunity of coming into contact with the principal people of the globe, and have thus been in a position to study on the spot anatomical, physiological, and pathological conditions, we have considered it proper to publish our observations and conclusions in regard to ozæna. To escape repetition, and especially to remain on purely scientific grounds, we shall divide the people of the earth, from an ethnical standpoint, into three large families—the white, the black, and the yellow. Indeed, if we consider carefully the characteristics of the Malays and the Redskins, we find that the representatives of those two races have had the Mongolians for ancestors. The colour of their skin,

¹ Read before the Congrès Français d'Oto-rhino-laryngologie, Paris, May, 1914.

the shape of their eyelids, the development of their malar bones, the flattening of the base of their nose, the thickness of their hair, and, generally speaking, their general facial expression, are all arguments in favour of the theory. Moreover, we find in the language of certain Indian tribes of South America a number of expressions very similar to certain Japanese words, and inscriptions and writings—undoubtedly vestiges of those which adorned the shrines of Buddha—are also often found in Mexican ruins.

We shall have little to say about the white race, as such a large number of articles on ozæna have already been published; we simply shall draw some conclusions from what we observed in cross-breeds of white with either of the other two races.

The blacks are particularly interesting, and a careful study of them in Africa, America, and Oceania reveals some very instructive facts. In the course of an extensive voyage around the Dark Continent we examined the nasal cavities of nearly five thousand negroes in twenty-two different colonies. On several occasions we penetrated into the interior of the country a long distance from the coast-line, and visited about a hundred different tribes. After making a most careful and minute examination of those aborigines of Africa all over the country, we may state, considering the large number that came under our notice, that they do not suffer from ozæna. We made a particular study of those races which are not full-blooded or pure—as the Mulattoes; the Moors of Mauretania, of Arab and particularly of Berber descent; the Peuhls; the Foulahs, whose ancestors were the Egyptian Fellahs; the Hottentots and the Bushmen, in whose veins there is a certain quantity of Mongolian blood; the Danakils, Somalis, and Gallas, of mixed Arab breed; and, finally, the Abyssinians, who at various periods of their history were often in close contact with the Egyptians. Those people also showed no signs of atrophic rhinitis. This disease is also unknown among the negroes we examined in Oceania and in the West Indies, and we had to return to the American continent to find it.

During our stay in Brazil, where three-quarters of the population is black, in Central America, and in the United States, we were surprised to find a large number of cases. We discovered it in pure breeds as well as among the Mulattoes and the Zambis (the offspring of negroes and Redskins).

Our excellent *confrères*, Drs. Chardinal (of Rio de Janeiro) and Jones (of Newport News, Virginia), also found a number of blacks afflicted with ozæna. Their findings show that the disease appears to be less prevalent among the negroes and mulattoes than among the white and yellow race, and we are entirely of that opinion. Their mucous membrane in general is very resistant to infection, and it requires a prolonged contact with very virulent microbes to cause a disease.

The yellow race of Asia and its different ramifications which spread practically all over the globe are particularly predisposed to atrophic rhinitis. We found it not only in the Chinese and Japanese, but also in certain Indo-Chinese of Mongol cross-breed, in the Esquimaux, the Laplanders, the Finlanders, the Malays, the Philipinos, the Hovas, and the Redskins. The frequency of the disease varies according to certain conditions, which we shall try to explain now in studying the causes of ozæna among the different races.

Contrary to the opinion expressed by F. Fraenkel, Gottstein, Coue-

toux, Boulay, and many other authors, who believe that ozæna is preceded by a pre-atrophic hypertrophic rhinitis, we agree with Bosworth that such is not the case. We examined the Chinese in their own country, in tropical climes, and in cold countries such as Canada in winter, and we did not find that climate was a factor in the frequency of the disease.

By studying a large number of cases, we found, generally speaking, that Mongolians have a tendency to atrophy of the anterior third of the inferior turbinal without any pathological symptoms. This is particularly evident if they reside in a hot climate; and in colder countries, we find they suffer from hypertrophic rhinitis, though not as often as whites. The Indians of the American continent are predisposed to that kind of atrophy, which is also found in a lesser degree in the cross-breeds. In none of the cases does the enlargement of the inferior turbinal seem to have any influence on ozæna, the frequency of which varies according to the more or less contaminated surroundings. Moreover, the African negroes often suffer from hypertrophic rhinitis if they live in a cold damp clime, though they do not show any lesions in their own country. We were astonished at the frequency with which we observed the deviation of the septum in the yellow race and especially in the Indians, among whom we found it in no less than 40 per cent. of all those we examined. This malformation is also more frequently found in the cross-breeds than in whites.

We scarcely ever found compensatory hypertrophic rhinitis in the largest side of the nasal cavities in the Mongolians; more often we observed the presence of a muco-purulent discharge with a crusty deposit devoid of odour. This corresponds to a state of pseudo-ozæna. In cases of true ozæna we found the odour weaker and less repulsive than in whites and blacks. We draw particular attention to this fact and believe it to be due to a physiological increase in the quantity of the nasal secretions proper to that race, which prevents the drying of pus and thus shortens the life of bacteria and partly prevents the formation of their toxins.

The deviation of the septum in the Mongolians, combined with the formation of non-ozænatous mucosities in much expanded nasal cavities, is an argument against the theory expressed by Zaufal, who maintains that atrophic rhinitis is found in those individuals who possess very large nasal cavities, where the weakness of the air draughts allows stagnation and decomposition of the secretions. On the other hand, the negroes—scarcely ever showing any deviation of spurs of the septum—have the arch of their palate lower than in the white and yellow race, the nose flat and broad with wide nostrils, and in Africa they do not suffer from ozæna.

We shall not bring forward arguments to offset the theories of epithelial metaplasia sustained by Siebenmann, or against Zarniko's theory of tropho-neurosis, or that of osteomalacia of Cholewa, of primary infection of the sinus, as advanced by Vieussens-Grünwald; we shall simply repeat that there is no atrophic rhinitis to be found among the natives of the Dark Continent. The same may be said about tuberculosis which also exists in those countries.

The infection theory of ozæna appears to be the only one which will satisfy every demand. We do not intend to discuss again, as it has already been done on several occasions, the value of the capsulated *cocco-bacillus* of Löwenberg, of the pseudo-diphtheric bacillus of

Belfanti and Della Vedova, and of the small bacillus of Pes and Gradenigo. We believe the cocco-bacillus of Perez (of Buenos Ayres) is really the specific vehicle of the infection, since experiments conducted in the laboratories confirm and prove that theory. The cocco-bacillus when injected into the circulation of an animal is the only one which causes atrophic rhinitis with the characteristic odour of ozæna. The other microbes found in the nasal cavities only act as secondary agents.

After examining in both Americas a multitude of Indians belonging to twenty-seven different races, and a large number of cross-breeds, we observed that local conditions and surroundings cause a more or less frequent appearance of the malady. Rare enough in those parts of the country where the natives live on high ground scattered in the open-air, the disease is found much more frequently in the towns and on the plains where they live under more congested conditions and breathe impure and contaminated air. Among the latter we even found the disease in about 6 per cent. of the population, and as the women are more confined to their homes and live in a more secluded manner than the men, they are more often infected. We observed the same conditions in Malaysia, China, and Japan.

Redskins and cross-breeds are equally infected by ozæna; still the yellow race appears to be more susceptible to the disease than the whites. We believe the reason for this condition is to be found not only in the filth some of the Mongolian races are addicted to, but also to the want of symmetry in their nasal cavities. The deviation of the septum which we observed very often in them, naturally causes respiratory defects and a greater abundance of stagnant secretions than in the whites—with equal lesions—and the bacillus of Perez finds a field quite prepared for its culture and development.

In Madagascar, our excellent *confrères*, Dr. Fontoynt, and his assistant, Dr. Roton, were kind enough to show us some cases of true ozæna among the Hovas. It is interesting to note that that race, which is of Malay descent with a slight mixture of Hindu blood, is the only one which shows any susceptibility to the infection, though they come in fairly intimate contact with the negroes who do not yet suffer from that disease.

That ozæna is distinctly of microbic origin is most conclusively proved by observations in Africa. Of all the blacks we examined in that vast continent, not one was infected—not even among the natives of mixed descent, whose ancestors may perhaps have suffered from the disease, which probably disappeared through the purifying agency of the sun's rays in a sand-covered, tropical region. And yet, when removed from the slave coast to Brazil—to an equatorial clime similar to that of their own country—these negroes, in contact with the infected aborigines, soon become infected themselves. When transplanted to the northern parts of South America, into Central America, or to the United States, they brought the disease with them or contracted it in these countries. Their Mulatto or Zambis descendants in turn were infected, and, according to statistics, these blacks are more often contaminated than those of pure blood. This is probably due to their closer and more intimate connections with the white and yellow races, and also to the heredity of the diathesis of the latter, which in a general manner reduces to a great extent their powers of resistance.

It is thus very evident that the blacks are not immune to ozæna,

and it will be interesting to know how long Africa and Oceania will remain free from contamination, and particularly the West Indies, which would seem to be more exposed to the infection, since they are inhabited to a great extent by Mulattoes who often visit the American coast.

Now, if we are allowed to draw certain conclusions from the observations we collected from all quarters of the globe, we may say that ozæna is an infectious disease and is found in all races. Yet the disease is less frequent among the blacks than among the whites, and is most prevalent among the yellow race. The marked deviation of the septum on these latter, to which we must add their state of habitual uncleanness and nasal irritation, produce in their mucous membrane a splendid breeding ground for the microbes.

The blacks of Africa, Oceania, and the West Indies are not yet infected, although they are susceptible to the disease, and the small number of Europeans who came under our notice—and they were not afflicted with ozæna—does not allow us to express an opinion as to the future apparition of the disease in those countries.

SOCIETIES' PROCEEDINGS.

ROYAL SOCIETY OF MEDICINE—OTOLOGICAL SECTION.

November 17, 1916.

H. J. MARRIAGE, *President of the Section, in the Chair.*

A Further Case of Otosclerosis associated with Otitis Media.— J. S. Fraser—(continued).

MR. C. ERNEST WEST: I am obliged to Mr. Fraser for showing us these specimens. I should like to ask a few questions with regard to the case of otosclerosis. This woman was aged something over sixty when she met with her death. How long had she been deaf? How long does Mr. Fraser think the condition had been going on—if it had been going on at all? If it had not been going on, what was the exact nature of the resting condition? And what is it that leads to progress in one case and to arrest in another? Histologically, are these patches of so-called osteitis vasculosa inflammatory tissue, or are they merely altered tissue—post-inflammatory tissue? I think that one very important point which Mr. Fraser brought out in connection with his previous demonstration was the anatomical feature respecting the existence of a layer of what one might call cancellous bone really surrounding the true capsule of the labyrinth, and lying between it and what one might call the adventitious capsule, which is really a part of the petrosa. That seems to be the central part of his work so far as it affords a basis for the spread of an inflammatory and presumably infective process, whether it has penetrated from the tympanum or has originated by deposition, by blood infection. This case, in which there