outcrops in the bed of the Wadi Sahba.* It is possible that the steep outcrops in sand noticed by Mr. Bertram Thomas at Banaiyan may be due to a similar formation.

P. ANALYSES OF WATER, SAND, AND SALT. By Dr. B. K. N. Wyllie.

The salinity of all the samples is many times (50 to 100 times) greater than that of normal river or lake waters. In every case the acid radicles determined exceed the bases; and some 2-4 gms./litre of sodium are presumably present—that is to say, the waters contain relatively large proportions of alkali sulphate and chloride, with subordinate amounts of alkaline earths (calcium and magnesium). One might perhaps guess that gypsum or gypseous strata underlie a good part of Mr. Thomas’s route. To attempt a complete analysis of any of the water samples would have been impossible, because of the extremely small quantities available. The largest sample, No. 22, contained 250 c.cs., a quantity much too small for complete analysis.

Of the sand samples, two contained an appreciable quantity of sodium chloride, two a heavy trace, three a trace, and two none.

The salt sample consisted of sodium chloride, 86.7 per cent., sodium sulphate, 9.25 per cent., water, 4.2 per cent.

The values obtained are detailed below:

<table>
<thead>
<tr>
<th>Sample No.</th>
<th>10</th>
<th>22</th>
<th>23</th>
<th>25</th>
<th>26</th>
<th>27</th>
<th>28</th>
</tr>
</thead>
<tbody>
<tr>
<td>Total solids dried at 110° C.</td>
<td>6.0</td>
<td>6.7</td>
<td>7.8</td>
<td>7.9</td>
<td>8.2</td>
<td>5.0</td>
<td>10.0</td>
</tr>
<tr>
<td>Calcium (Ca)</td>
<td>0.48</td>
<td>0.7</td>
<td>0.72</td>
<td>0.36</td>
<td>0.56</td>
<td>0.25</td>
<td>0.61</td>
</tr>
<tr>
<td>Magnesium (Mg)</td>
<td>0.36</td>
<td>0.08</td>
<td>0.24</td>
<td>Less than 0.13</td>
<td>0.19</td>
<td>0.32</td>
<td></td>
</tr>
<tr>
<td>Sulphate (SO₄)</td>
<td>2.84</td>
<td>1.06</td>
<td>3.2</td>
<td>1.6</td>
<td>2.2</td>
<td>1.6</td>
<td>2.4</td>
</tr>
<tr>
<td>Chloride (Cl₂)</td>
<td>0.24</td>
<td>2.6</td>
<td>2.8</td>
<td>1.9</td>
<td>2.4</td>
<td>not estimated</td>
<td></td>
</tr>
</tbody>
</table>

All quantities are expressed in gms./litre. In no case was the water alkaline to phenolphthalein.

DISCUSSION

Before the paper the President (Admiral Sir William Goodenough) said:

We welcome to-night a pioneer: not one who has sprung into sudden prominence by the successful accomplishment of a single journey, but one who by steady and long application to the knowledge of the country, its peoples, their language and their customs, has added very greatly in the last two years to geographical and kindred sciences, culminating in the first crossing of the Rub’ al Khali by an European.

Mr. Thomas, having performed his duty with distinction during the war, found himself at its conclusion acting as a political officer in 'Iraq under Sir Percy Cox, to whom we shall listen with great pleasure later in the evening. From 'Iraq Mr. Thomas went to Transjordania, where he spent two years under the command of Mr. Philby. It was from there that he went to Muscat, where he has been for six years as financial adviser to the Sultan. He had always in his mind the possibility of making this unique third journey. The Rub‘ al Khali is that tract of country which lies to the north of the range of mountains bordering on the south coast of Arabia and to the south of the Persian Gulf. Some few have penetrated a little way from the south. You may remember that the Bents went there some years ago; Hirsch also and Captain Bosanquet and a few others; while

in 1929 Squadron-Leader Cochrane made what he correctly termed "An Air Reconnaissance of the Hadhramaut." It may be that an Arab or two has made the whole journey, but for the first time we shall hear to-night a description of the "Empty Quarter."

The audience at this meeting, Mr. Thomas, is composed, I may tell you, almost exclusively of Fellows of this Society. That will show the eagerness with which we await your lecture. The stage is set. The curtain rises on Arabia.

Mr. Thomas then read the paper printed above, and a discussion followed.

The President: To our great regret Sir Arthur Keith is unable to be with us this evening, but I will call upon Professor Seligman to speak from the anthropological point of view.

Professor Seligman: I have had the honour of being asked to work up Mr. Thomas's amazingly interesting anthropological results. Directly I began to study his figures and photographs it was obvious that a wide field for discussion of origins and migrations was opened up. The actual people with whom Mr. Thomas dealt can be divided into two classes: the Arabic-speaking tribes and the non-Arabic-speaking tribesmen on the edge of the Sands, who nevertheless speak Semitic languages. As to the Arabs, these include a number of folk from 'Oman, fairly tall men with long oval faces, high round heads, and pronouncedly Armenoid—so-called Jewish—noses. Such men as those you saw on the screen from 'Oman agree precisely with the two 'Oman skulls in the Royal College of Surgeons, and bear out the conclusions that I arrived at some years ago from a general study of southern Arabia. But besides these there is a round-headed type with a straight, rather short, nose (not the so-called Socratic type of northern Arabia), which I am unable to place, and there are also a certain number of people whose photographs might well be confused with those of nomad Arabs from the steppe of Kordofan, though their head measurements show that they are rather rounder-headed than the latter.

Coming to the non-Arabic-speaking tribes, the first question is who they are, that is to say, to what racial type do they belong? Only after this has been settled is it reasonable to investigate how they reached their present home. On the screen at the moment are photographs of three men, the two outside being typical Armenoids in regard to facial characters—they are, in fact, just such roundheads and have such Armenoid noses as might be found in the Levant—while the man in the centre of the group is of a totally different type and certainly non-Armenoid. With regard to cephalic index, which, as you know, measures the proportion of head length to head breadth and is one of the most important criteria of race, the average index of twenty men speaking non-Arabic languages is 87.4, about two units higher than that of an Arabic-speaking group of eight. Excluding the tall 'Omani men, "Arabs" and "non-Arabs" have about the same stature (64–65 inches).

Summing up, we can only say that (omitting a small number of unusual types) there is no very outstanding difference between the Arabic- and non-Arabic-speaking groups; both are brachycephals, and in both there are many individuals, in the photographs constituting definite majorities, with well-marked Armenoid noses. These southerners must then be regarded as predominantly of the Armenoid race, and this, as I pointed out in 1917, is the race to which the Arabs of south-western Arabia belong. There does not seem to be any reason for regarding them as Hamitic; indeed, they differ entirely in measurements and appearance from the Beja (Hamites) of the Sudan, while it is only necessary to glance at Mr. Thomas's photographs of Somali to see that in feature and general make-up they in no way resemble these.
Now how have these Armenoids reached South Arabia? Obviously they came from Mesopotamia, or from country even farther north, though their migration may have started so long ago that in details of feature they may well differ considerably from the present-day inhabitants of Mesopotamia. Nor can we ignore the results of miscegenation once the immigrants had reached southern Arabia. I stress these points because Mr. Thomas informs me that his South Arabian do not remind him of the Mesopotamians he knows so well. And, lest you may find a Mesopotamian origin somewhat difficult to accept, I may point out that on South Arabian coins of about 70–40 B.C. there are many representations of round-headed people. I would also emphasize that twice in mediaeval history there were movements of considerable bodies from Mesopotamia to South Arabia and vice versa. About A.D. 570 the Persians conquered the Yemen, and maintained a viceroy there for over fifty years, i.e. until 628. A few years later Khalid Ibn Walid, “the Sword of God,” one of Muhammad’s generals, starting from Arabia marched into Mesopotamia with what must have been a considerable following, although we know that his army was of no great size compared with that of the Persians he conquered.

That is all I can say at the moment, but I think the outline I have put before you fairly represents the main definite anthropological results of Mr. Thomas’s wonderful journey. As bearing on these conclusions I may add that since Mr. Thomas’s paper I have had the opportunity of discussing his photographs with the Abyssinian scholar and traveller, M. Marcel Cohen, who sees no suggestion of Abyssinian traits.

The PRESIDENT: I now call upon Dr. Calman, whose knowledge of zoology is surpassed by none.

Dr. CALMAN: I have been asked to say a few words about the zoological specimens collected by Mr. Bertram Thomas and presented by him to the British Museum, where they are now being studied by my colleagues. The natural history collections of the British Museum have been greatly enriched in the past by many of the travellers and explorers who, from time to time, have come before this Society to relate their adventures and announce their discoveries. It has often happened however that those journeys which have made the greatest demands on the intrepidity and endurance of the travellers have been least productive in this respect, for the obvious reason that the pioneer whose attention is occupied in finding his way and providing for the safety of himself and his party has often little time to spare for collecting purposes. It is all the more gratifying therefore to be able to tell you that, amid the distractions of the journey which he has just described to us, Mr. Bertram Thomas has been able to get together and bring home a collection of exceptional value and importance, embracing all the chief groups of terrestrial animals from mammals down to spiders. Coming as this collection does from a region hitherto unknown, it is not surprising to find that some of the less-known groups of insects, for example, are yielding a very considerable number of novelties, as they come to be studied in detail. What is surprising however is that even in such well-studied groups as mammals, reptiles, and butterflies Mr. Bertram Thomas has been able to discover a number of well-marked forms that are new to science.

While we are naturally very pleased at the discovery of new species and subspecies, an even greater service to science is rendered by those parts of Mr. Thomas’s collection which have not this claim to novelty. Arabia, lying on the borders of three of the great zoological provinces into which the world is divided, presents problems of particular interest to the zoogeographer, and it is for the light that they throw on many of these problems that the new collections are specially important. We find, for instance, that the reptiles from the Qara
Mountains are all of African types, while farther to the north in the Rub' al Khali the reptiles are all Palaeartic species coming from the north. Of an Oriental or Indian element there appears, as far as the collections have been studied, to be little trace; the Indian Wolf, for instance, which we also know from Muscat and Aden, is a species of Palaeartic affinities, extending only into northern India. A temporary exhibit of a few of the specimens collected by Mr. Bertram Thomas has been placed in the Central Hall of the Museum, so that visitors may be able to see something of the results of his collecting.

The President: No meeting of such a nature as this would be complete without some words from Sir Percy Cox, and I now call upon him.

Sir Percy Cox: I am grateful for the opportunity given me to-night of paying my tribute both to the splendid accomplishment of which we have heard and to Mr. Thomas's outstanding qualities for exploration.

I have special reasons for being interested both in the subject of the lecture and in Mr. Thomas personally. As the President has told you, he served under me in 'Iraq, but I should like to explain that when he actually entered 'Iraq service (being transferred from the military to the civil side for political work with the tribes) it was while I was away on deputation in Tehran, and he was selected by Sir Arnold Wilson, who had taken over my duties when I left. I found Mr. Thomas there when I came back to inaugurate the High Commissionership, and it was at that period that he served under me. Later, when Mr. Philby was transferred to Transjordania, Mr. Thomas, thinking he would like a change, followed his fortunes there, and it was after a period of service in that country that he accepted the post of Financial Adviser to the Sultan of Muscat.

My second reason for having a special interest in this lecture is that I spent five years in 'Oman myself, and so naturally like to hear of all that passes in that region. It is now thirty years ago since I made a journey from Abu Thabi on the Persian Gulf Coast across the northern promontory of 'Oman, where the Rub' al Khali stretches out towards the north-east, and thence along the edge of the desert back to Muscat. En route I ascended the Jabal Akhdar range, and from the crest, from 7000 to 8000 feet high, I looked down with longing on the great wadis which flow down from the watershed of the Hajar Range and stream out like ribbons into the Great Desert. I do not suppose I saw the actual beginning of the Nafud, but there was nothing between me and it, except the distance, to limit the view, and I remember how I then longed, as I am sure every other Englishman who has travelled in 'Oman has longed, to solve the riddle of those great sands. I did indeed make serious inquiries on the subject and took numerous notes as to what the possibilities were, and how the crossing could be carried out, from east to west. The fundamental difficulty seemed to be that one was pretty sure to be scuppered on reaching the tribal fringe on the other side. Before I had got very far with my inquiries however I was promoted to Bushire and had no opportunity of pursuing the subject farther. But I think the idea of crossing from south to north was an excellent one and just as effective, for Mr. Thomas's route took him right through the centre of the desert, and I do not think that any fuller information would have been or will be gained by crossing the other way. We now know generally what the desert contains and consists of, whereas before Mr. Thomas's expedition our only measure of information was purely negative. We knew that certain Badawin tribes grazed into the edges of it, but except a few skins and an occasional captured antelope nothing ever came out of it. Now we know all about it; in fact, Mr. Thomas makes me feel very humble, because though I did a great deal of travelling in 'Oman it was in a small way, as an official; one's time was limited to two or three weeks as a rule, and it was difficult to do anything of much value. Mr. Thomas, on the other hand, studied before he went, and has
displayed extraordinarily good qualifications for exploration work. As you see, he took immense pains to collect natural history specimens; and he took sights and had an eye to the scientific aspects of his journey. A good deal of the ground covered by him in his earlier excursions I had myself passed over, but I find that I missed half the interesting things that he has told us of. In conclusion I should like to congratulate him on his splendid achievement and on his lecture of this evening and tell him how much, speaking as an old hand who has travelled in the same region, I admire the great efficiency with which he carried out his project.

The President: It would require expression far beyond my powers to make a proper appreciation of Mr. Thomas’s work, his lecture, and all that he has done, in the few moments that I allow myself. When the book Mr. Thomas is writing is produced it will contain a wealth of information of a most absorbing interest that will put him in the front rank of travellers, keen observers, and most faithful recorders. Those who have read his book, ‘Alarms and Excursions in Arabia,’ and his articles in The Times will know that his book will be produced in the most attractive fashion. You have heard three men, each of them pre-eminent in the activities which occupy them—anthropology, natural history, and the administration of great policies—give great praise to Mr. Thomas; and I, on your behalf and on behalf of the Society, would like to endorse to the full every word that they have said. Though he travelled dressed as an Arab, he made no disguise either of his race or of his creed. He respected the religion of those with whom he travelled and they respected his. There is no doubt that the confidence which he inspired is something which will be of the greatest possible benefit both to this country and to all future travellers. Very interesting, too, in The Times is his reference to the communal spirit of people bred in conditions of great hardship and privation. Cross thousands of miles of the centre of Brazil and you will find exactly the same description of the people given by Mr. Dyott.

It is not for me to speak of the geological aspects; those are in the hands of the proper authorities, as you heard, and it is quite possible that we may be able to make a chart of the water-levels as has been done in the Libyan Desert by Dr. Ball. Of the survey work I can perhaps speak with greater authority. We are filled with admiration at the accuracy of the positions in Mr. Thomas’s traverse, the positions of the wells, and numerous facts of that kind; and that very valued colleague of ours in this Society, Mr. Reeves, may dwell with pride on having had so apt a pupil.

I spoke an hour ago—it may be more: the minutes have passed with great rapidity—of Mr. Thomas being a pioneer. It is to pioneers that credit is due. I remember some years ago walking with General Smuts and hearing him say how hard is the way of the pioneer and how long it is before posterity gives him proper merit. Many present will remember how Dr. Hogarth used to speak of Gertrude Bell and of the journeys, now made easy, of which she was the pioneer. There are many others, too. Others will go to the Rub’ al Khali and they will follow in Mr. Thomas’s footsteps. I think they will say—I do not talk Arabic, but have borrowed a phrase from my friend Ja'afar Pasha—that Mr. Thomas has changed the name of the Rub’ al Khali to the Rub’ al Kamil.

The hour is rather later than we sometimes are, Mr. Thomas, but we would willingly have listened to you for much longer. With that I ask you to accept, on our behalf, not only our thanks but our unbounded admiration. Five weeks from to-day I shall have the privilege of presenting to Mr. Thomas the Founder’s Medal—an award of which His Majesty has approved. Every Fellow of this Society will, as ever, welcome His Majesty’s judgment in this matter.