

points of maximum absorption, or most persistent edges in each of the bands measured by Hartley and Dobbie. This is shown in the following statement quoted from his paper (Wilhelm Friederichs, *Zeit. für wissenschaftliche Photographie*, B. iii., 154-164, 1905).

I have added in italics the wave-length numbers corresponding to Baly and Collie's oscillation frequencies for comparison:—

	Vapour. Friederichs.		Solution in alcohol. Hartley and Dobbie.		Difference.		Baly and Collie.
	λ		λ				λ
(1)	2670	...	2681	...	11	...	2683
(2)	2633	...	—	...	—	...	2656
(3)	2588	...	2599	...	11	...	2610
(4)	2526	...	2541	...	15	...	2554
(5)	2458	...	2485	...	27	...	2484
(6)	2404	...	2429	...	25	...	2433
(7)	2356	...	2376	...	20	...	2380
(8)	2305	...	2330	...	25	...	—

He points out that the bands of the substance in solution which without doubt correspond with those of the vapour are all shifted towards the red, as might be expected, but that the shift appears to be greater the smaller the wave-lengths of the absorbed rays. The comparison of Baly and Collie's numbers with those of Hartley and Dobbie is very interesting in this connection, inasmuch as they show a close general agreement in their divergence from the measurements of Friederichs. Furthermore, the following points may be noted:—

First, the omission of the second band in Hartley and Dobbie's spectrum; second, the omission of the eighth band by Baly and Collie; third, there is a close agreement between Hartley and Dobbie's and Baly and Collie's numbers in the first, fifth, sixth, and seventh bands, but the two sets of measurements for the third and fourth bands differ more widely than the others.

It may be mentioned that the second very narrow band is visible on the photographs taken by Hartley and Dobbie, though it can scarcely be considered as measurable; no doubt a longer exposure would have rendered it more plainly. Those who have measured similar series of bands in the visible region, for example, those in the spectrum of potassium permanganate, which are also eight in number, will appreciate the close approximation of the above figures.

W. N. HARTLEY.

Royal College of Science, Dublin, September 19.

Rhymes on the Value of π .

THE following rhyme is in imitation of the French and German verses given in NATURE (August 17) in which the number of letters in each word correspond to a numeral in the value of π . The three concluding lines are somewhat obscure; it seems to have occurred to the author that the method is a misuse of language, and he expresses the hope that NATURE will take a more lenient view than Dr. Johnson might be imagined to express.

To the Editor of NATURE.

Sir,—I send a rhyme excelling

3 1 4 1 5 9

In sacred truth and rigid spelling.

2 6 5 3 5 8

Numerical sprites elucidate

9 7 9

For me the lexicon's dull weight.

3 2 3 8 4 6

If "Nature" gain,

2 6 4

Not you complain,

3 3 8

Tho' Dr. Johnson fulminate.

3 2 7 9

F.R.S.

The Celtic Pony.

IN a review, signed "R. L.," of "The Færøes and Iceland," in NATURE of September 21 (p. 506), I was surprised to read that I had credited Prof. Ewart "with being the first to regard Przewalsky's horse as a variety of *Equus caballus*." I have just re-read the paragraph relating to the wild horse in my "Appendix on the Celtic Pony," and I can find no passage which, it seems to me, could by any possibility be made to bear this strange construction.

Sanson's subspecies *E. c. hibernicus* appears to include all the various ponies of the British Isles, the Breton in France, as well as the horses of Iceland, Norway, and Sweden. It has been recognised for some time past that the Icelandic horses are of two different types, while the Swedish horses are admittedly very mixed. Moreover, as a result of a recent tour in Norway, it has become evident to me that there are in that country at least two distinct kinds of native horses (represented by the pure fjord horse and the Gudbrandsdal horse). In view of these considerations, the statement that the Celtic pony is "probably inseparable" from the somewhat heterogeneous assemblage (as it now appears to be) included under *E. c. hibernicus* becomes a little obscure. But, as "R. L." points out, I did not make this statement. I grant, however, that it might have been better had I made some allusion to this matter.

But why I should have been expected in an "Appendix on the Celtic Pony" to have entered into a discussion as to the proper technical name to apply to *E. przewalskyi* or to have recorded an irrelevant criticism of Prof. Ridgeway's new name of *E. c. libycus*, I am at a loss to understand.

FRANCIS H. A. MARSHALL.

The University, Edinburgh, September 24.

GREEK ARCHAEOLOGY.¹

THE archaeologist justly ranks himself as a contributor to the world's knowledge on the same level as those who discover previously unknown forces in nature or new facts in the life-history of animals, extinct or living. Archaeology, which is a branch of the great science of anthropology, discovers and correlates new facts in the early history of civilisation. Greek archaeological discovery must always be of most especial interest, since it tells us of the origins of that early civilisation of the Mediterranean basin from which our present-day culture is derived. One of the most welcome yearly publications dealing with the subject is the "Annual of the British School at Athens," the tenth volume of which lies before us. It deals with the British work of 1903-4, besides containing independent articles on matters of archaeological interest.

Dr. Arthur Evans's work at Knossos does not occupy so much space in the "Annual" as usual. The discoveries of the year, while most interesting, were not so new and epoch-making as those of former years, and the chief find, the tombs of "Ja'fâr's Papouira" (τοῦ Τζαφέρ ἡ Παπούρα) and Isópata, are described by Dr. Evans in a separate communication to *Archaeologia*. The first-named tombs, on a hill north of the Knossian palace, were of various types; (1) chamber-tombs approached by a *dromos*; "in many cases these contained clay coffins, in which the dead had been deposited in cists, their knees drawn towards the chin"; (2) shaft-graves; (3) pit-caves, "or pits giving access to a walled cavity in the side below." In 2 and 3 the skeletons were extended at full length. On the hill of Isópata, about two miles north of Ja'fâr's Papouira, a very fine tomb, no doubt that of a king, was found, with a smaller one by its side. The larger consisted of a square chamber of limestone blocks, eight metres by six, "with the

¹ "The Annual of the British School at Athens," No. x. Session 1903-4. (London: Macmillan and Co., Ltd.)

side walls arching in 'Cyclopean' fashion towards a high gable," which had long ago been quarried away. The lofty entrance-hall was approached by an imposing rock-cut dromos. "In the floor of the main chamber was a pit-grave covered with slabs. Its contents had been sifted for metal objects in antiquity, but a gold hairpin, parts of two silver vases, and a large bronze mirror remained to attest the former wealth of such. A large number of other relics were found scattered about, including repeated clay impressions of what may have been a royal seal. Specially remarkable among the stone vessels is a porphyry bowl of Minoan workmanship, but recalling in material and execution those of the Early Egyptian Dynasties. Many imported Egyptian *alabaster* were also found, showing the survival of Middle Empire forms besides others of Early Eighteenth Dynasty type. Beads of lapis lazuli also occurred, and pendants of the same material, closely imitating Egyptian models. Four large painted jars with three handles illustrate the fine 'architectonic' style of the Later Palace of Knossos, in connexion with which the great sepulchral monument must itself be brought."

The form of this square-chambered mausoleum is unique, and may be compared as a contrast with the *tholos* or beehive tombs of the Greek mainland. Dr. Evans says that he was tempted to recognise in it the traditional tomb of Idomeneus, but that the other tomb near by, which is cut in the rock, is hardly considerable enough to be taken for that of Meriones, which tradition placed beside the other. Nevertheless, Dr. Evans's identification may be correct; the important tomb on the slope of the hill looking towards Knossos and Herákleion would naturally be identified by the later Greeks as the resting-place of one of the greatest heroes of the island, and any other tomb close by, whether it were as large as the first or not, would then be dubbed the grave of his legendary companion.

Another interesting discovery was made outside the limits of the palace in the shape of a Minoan paved way leading due west from the "Stepped Theatral Area" discovered in 1903 towards the modern road to Candia. By the side of this were found magazines with interesting deposits of inscribed tablets apparently referring to the contents of the ancient royal stables and armouries; chariots, wheels, and yokes are pictured on them, and large numbers of arrows. Close by were found bundles of the very arrows mentioned on the tablets. A later Roman causeway overlay part of this road, but this was evidently merely a coincidence, for that the knowledge of the old road was lost after the close of the Minoan period is shown by the fact that during the early Hellenic ("Geometrical") age a well was sunk over the old Minoan way and driven right through it. This is a very interesting proof of the entire break in culture between the Mycenæan and "Geometrical" peoples in Crete, and is a strong argument in the armoury of those who believe that the Minoans or Mycenæans were not Greeks in our sense of the word at all, but a totally different race probably of non-Indo-European speech.

In the palace itself interesting finds were made. A section cut in the western court enabled more accurate notes of the stratification of the ancient remains to be made, resulting in a further subdivision of the Minoan period and a more accurate placing of the polychrome ("Kamáres") pottery as belonging to the stratum "Middle Minoan II." The Kamáres pottery is known by Egyptian evidence to be contemporary with the twelfth dynasty. The palace as it stands is late Minoan, which corresponds with the Egyptian evidence, which dates the Keftians who brought vases of the grand Knossian style to Egypt as contemporary with the eighteenth dynasty. Beneath the Minoan strata was found a deep Neolithic stratum going down to the virgin rock. From the modern surface of the ground to the base of "Early Minoan I." (the sub-Neolithic period) measures 5 m. 33 cm. in depth; the Neolithic stratum is 6 m. 43 cm. The date B.C. of the eighteenth dynasty and the late Minoan palace is roughly 1500; that of the twelfth dynasty and Middle Minoan II. about 2200. "Middle Minoan II." is 2 m. 50 cm. below the surface; the virgin rock is 7 m. 75 cm. From this the great age of human settlement at Knossos will be seen at a glance. A peculiarity of the Knossian site is that the late Minoan remains are found almost



FIG. 1.—Two polychrome vessels of the Middle Minoan Period. From the Palace at Knossos.

immediately beneath the modern surface of the ground. This points to the place having been kept clear of later buildings, the tradition of its sanctity and heroic associations having always persisted.

An earlier western façade of the central court was also discovered, and further cists belonging to the first period of the later palace, in the magazines. The discovery of fragments of reliefs in these cists (one of them, representing the head of a charging bull, was identified by one of the workmen as a portrait of the devil) led Dr. Evans to suppose the existence of upper halls, to which the reliefs had belonged, above the magazines. These halls seem undoubtedly to have existed, and a ramp led up to them from the "Stepped Theatral Area."

These are all very interesting results, and show how much there is still to be discovered at Knossos.

The excavations of the British School at Athens at Palaikastro are described by Messrs. Dawkins and Currelly. The remains of a shrine of the Cretan snake-goddess (analogous to those at Knossos and Gourniá) were found, besides some interesting *larnax*-burials. Mr. Dawkins gives a careful analysis of the pottery found in the town ruins, and a very useful comparative table of the strata of the Minoan period, with illustrative examples from Cretan and non-Cretan sites (p. 195). Mr. H. R. Hall publishes a

photograph of an important Egyptian tomb-painting depicting Minoan ambassadors bringing rare vases of Cretan workmanship to the court of Queen Hatshepsu at Thebes.

In connection with the point raised anent the Minoan way, already described, at Knossos, that there was a great gap in history between the last (presumably non-Aryan) Minoans and the first (Aryan) Hellenes, we may note that Mr. R. S. Conway returns to the charge in defence of the "Aryanism" of the Minoans in another article on the Eteocretan inscriptions of classical times, which he considers to represent the speech of the Minoan Cretans. There is no proof of this whatever, and even if Mr. Conway were to succeed in proving the Indo-European character of this late "Eteocretan" language up to the hilt, this would not in the least shake our conviction that the old Minoans spoke a non-Indo-European tongue. The craniological and archæological evidence must be taken into consideration as well as the philological, which can apparently be twisted into meaning anything that the investigator wishes. The craniologist assigns the Minoans to the "Mediterranean" race, to which the ancient Egyptians also belonged; and the archæologist brings the Minoan and Egyptian cultures back almost to a common origin. Further, Mr. Conway's idea goes counter to those of many of the philologists themselves, especially Kretschmer, whose view that the præ-Hellenic speech of Greece was non-Aryan agrees with the results of craniological and archæological research, and is generally accepted now.

This completes the list of articles dealing directly or indirectly with the Minoan or Mycæan antiquities, the relics of the prehistoric culture of Greece.

Mr. Dawkins contributes an interesting philological article, entitled "Notes from Karpáthos," describing the linguistic phenomena of that little known island, which he visited two years ago. The dialect seems to be more divergent from that of Crete than might have been expected. It presents all the peculiar dialectical phenomena of the Southern Ægean. Such pronunciations as "hyaloshorzhō" (χαλοσὀρζο) for Καλοχωρίον, which strike one so forcibly in Crete, are well represented. Aberrant grammatical forms are not uncommon. The old third plural in -σι(ν) survives. Here we have a considerable difference from Cretan practice, which prefers third plural in -νε: "they went," in Cretan ἐφύγανε, is in Karpáthian ἐφύγασι(ν), and "they are walking," Cretan πατούνε, is in Karpáthian πατούσι(ν), which sounds quite "Attic." This is an interesting survival. Articles of this kind are of great use and value.

Mr. M. N. Tod and Mr. E. S. Forster add contributions to epigraphic scholarship, and the latter also describes Laconian topography and archæological sites. Mr. A. J. B. Wace has an article on Greek grotesque figures as charms against the evil eye. The modern Hellenes wear charms in the shape of little silver or coral figures of hunchbacks (*gobbi* or *gobbetti*) for the same purpose.

Dr. Schäfer's German article on "Altägyptische Pflüge, Joche," is apparently published in the "Annual" on account of the ancient Egyptian basket figured on p. 140, which is of the same type as the Greek *liknon*, discussed by Miss Jane Harrison in her note on the "Mystica Vannus Iacchi," which follows. Otherwise one would have thought that its proper place would have been found in an Egyptological publication. The Berlin Museum has a large collection of ancient Egyptian agricultural implements, which are, however, of course all, with the exception of a fine plough and the basket aforesaid, of well known types equally well represented in other museums.

H. R. HALL.

SOUTH AFRICAN MEETING OF THE BRITISH ASSOCIATION.

LETTERS from local correspondents in South Africa have just brought us some notes upon the recent meeting of the British Association. During the progress of the meeting several cablegrams which appeared in the *Times* were summarised in these columns, so that many of the matters mentioned by our correspondents have already been recorded. Dr. J. D. F. Gilchrist has sent us an account of the part of the proceedings of the association at Cape Town, and the following particulars in so far as they are connected with Cape Town are from his communication. As, following our usual custom, we have arranged with officers of the sections for reports of the proceedings at sectional meetings, it is unnecessary now to give any account of these meetings.

Dr. Gilchrist states that as early as August 6 some of the British Association visitors began to arrive in Cape Town by the *Tintagel Castle*; eighteen more arrived on August 8 by the *Kildonan Castle*, and forty-three by the *Durham Castle* on August 12. The main body, however (eighty-six), including most of the official party, arrived by the *Saxon* on Tuesday, August 15.

The voyage of the main party was favoured by excellent conditions of weather, and the usual routine of life and entertainments on board was diversified by lectures by members on appropriate subjects of interest, and in one or two cases by scientific work, such as the collecting of plankton and temperature observations of sea and air. A few advance copies of "Science in South Africa," a handbook prepared on the occasion of the visit, were on board, and afforded some insight into the scientific work and problems engaging the attention of South Africans.

On arrival at Cape Town Docks the passengers were transferred to the train waiting alongside, and about 10 a.m. on August 15 arrived at the main station, where they were met by the mayor, the hospitality committee, and others. The council of the association met at 12 noon and the general meeting at 2 p.m., and the formal business was quickly got through.

The details of the somewhat extensive programme were in an advanced state of preparation, the general plan and coordination of the whole having been undertaken by a central organising committee for South Africa, the local details by the several reception committees at the seven local centres to be visited. These local committees were subdivided into entertainment, hospitality, excursions, and finance subcommittees.

Great assistance was rendered by Mr. Silva White, assistant secretary of the British Association, who arrived some weeks before the first meeting and took over the general direction of, and responsibility for, the arrangements. He arranged for the services of four assistant secretaries, who were instructed as to the details to be carried out on certain sections of the programme allotted to them, an arrangement which was fully justified by the subsequent results.

The formal business of the association commenced with the presidential address, which was delivered on the evening of August 15 in the City Hall, which had just been completed in time for the meeting. The work of the various sections began the following day, and occupied the mornings from Wednesday, August 16, to Friday, August 18, half the sectional work being transacted at Cape Town and half at Johannesburg.

In the afternoon of August 16 there was a large attendance at the Governor's garden party, and in the evening the Mayor met the visitors at a reception in the City Hall.