facilitera la diffusion de la notion des actions diastiques, dans le domaine pratique."

The author fulfils the promise of his preface in giving a clear though brief exposition of the action of enzymes or *diastases*, special attention being directed to the experimental methods employed in the study of this subject and in their application to the brewery and the distillery.

The errors in spelling are numerous, and should be revised in a subsequent edition. Schunck appears as Schmuk; Marshall Ward figures as two persons, Marshall and Word; Croft Hill's individuality is also lost as Crop and Hill; O'Sullivan loses the O' and Lindner is spelt Linter, whilst the English name Heron and the German, Geduld, are converted into the French Héron and Gédulte.

Erythrozyme is written erythrozone, racemosus is spelt racinosus, penicillium appears as penicellium and octoporus as octopodus.

An index would be a valuable addition. J. B. C.

Mongolia and the Mongols: Results of an Expedition to Mongolia in the Years 1892 and 1893. By A. Pozdnéeff. Vol. ii. 8vo. Pp. 516. Numerous photo-engravings (Russian, 1900).

THIS is the second of a series of volumes on Mongolia and its inhabitants which are being prepared by Dr. A. Pozdnéeff, and it contains the traveller's diaries during the second year of his journey, when South-eastern and Eastern Mongolia were visited. Starting from Peking, Dr. Pozdnéeff went to Kalgan—the centre and depot for Russian trade with China—and thence to Kuku-khoto, or Gui-hua-chen, the next important commercial centre of Southern Mongolia. Returning to Kalgan, he visited that portion of Mongolia which lies on the eastern slopes of the Great Khingan—namely, the towns Fen-nin-sian and Zhe-ho, or Chen-de-fu, whence he went to Dolon-nor (Lama-miao). All these places are well known long since, but, speaking currently Mongolian, Dr. Pozdnéeff has learned much more about the trade in these towns than other travellers had before him, and having, moreover, in his capacity of learned Mongolist a free access to the Lamaite monasteries, he was enabled to collect a great amount of information about the inner life of Mongolia, various questions of worship, and especially about the antiquities preserved in the monasteries. Proceeding from Dolon-nor northwards and north-westwards, towards the Kerulen River, he visited the ruins of Kai-pin-fu—the thirteenth century capital of Khubilai-khan—and obtained there full casts and photographs of an interesting inscription dating from the fourteenth century. Another very interesting Tibetan and Mongolian inscription, dating from 1626, was copied in the same way at Tsagan-suburga, on the Shara-muren River. It may now be taken that this much-controversed spot was one of the five Lao or Kidan capitals—Lin-han-fu.

The remarks of the diary on the way across the Gobi are especially interesting, in that they give the exact limits between the Gobi proper and the zone of land which lies on the western slopes of the Great Khingan. This limit corresponds with a line which may be drawn on the Russian General Staff Map through the spots where the rivers shown on this map as flowing from the Khingan end in small lakes or marshes as they enter the Gobi. M. Pozdnéeff, who crossed the Gobi in June, fully confirms the view upon this region which begins now to prevail, namely, that it is not a desert, but a dry, rolling prairie. In fact, it has the same physical aspects as the dry "rolling prairies" of Canada at the approach of the Rocky Mountains.

The volume gains very much from the excellent photo-engravings with which it is illustrated. They give a good idea of the physical characters of these portions of Mongolia. P. K.

LETTERS TO THE EDITOR.

[The Editor does not hold himself responsible for opinions expressed by his correspondents. Neither can he undertake to return, or to correspond with the writers of, rejected manuscripts intended for this or any other part of NATURE. No notice is taken of anonymous communications.]

Gothic Vestiges in Central Asia.

I AM in thorough accord with the main principles indicated in Dr. A. C. Haddon's communication, which appeared in NATURE, vol. lxiii. p. 309 (January 24), more especially as to the eastern extension of a fair dolichocephalic race or races, at least as far east as the north-western frontiers of China. It has, however, always struck me, as a student of the ethnology of these districts, that sufficient attention has not been given to the geographical changes that have certainly occurred throughout the whole of Central Asia, and without which it appears impossible to understand such writers as Herodotus, Arrian and Ammianus Marcellinus. I claim no new discovery in suggesting, with Colonel Tchaikofsky (quoted by Schuyler, vol. i. p. 53), that during the Classical period the rivers Chu and Sary-su, instead of losing their waters in desert lakes, united at Perovsky with the Jaxartes, and flowed along the deserted bed, now known as the Jany Darya, joining finally the old Oxus and making their way along what is still known as the "Ancient Bed" of the Amu Darya to the Caspian. We thus arrive at a satisfactory explanation of the crossing of the "Araxes" by Cyrus, and his description of the homeland of the Massagetae, whom we are then justified in associating ethnologically with the Getae or Goths of other authors. This would throw light also on the position of Arrian's Alexandria Eschate, which I would identify with the modern Jizakh. This was situated on the Tanais, which seems to have been an overflow channel of the upper Jaxartes, leaving the main river at the bend below Khojend and flowing past Jizakh into the Taz Khane, whence it found its way into the Jany Darya.

We thus also get a satisfactory position for the Issedones, also a Gothic tribe ("West-Saetons"), east of whom were the Asii, Asiani or Pasiani, the Wusuns of the Chinese, who are described as "having blue (or green¹) eyes, red beards and monkey-like faces"—alluding to their faces covered with tawny hair.

When, however, Dr. Haddon comes to his Chinese authorities several inaccuracies appear in his account. As Dr. Haddon himself is, apparently, not a student of that language, he has naturally been dependent on others, and the second-hand information with which he has been supplied is in the last degree misleading. He speaks, for instance, of the "Ssé or Sek (who are identified with the Sacae)." I have a fair first-hand acquaintance with the older Chinese writers, and find myself unable to place these tribes. There were, at the period of which he speaks, Shuks, or rather Pa-shuks, in Szechwen; but there is no reason to connect them with any external tribe, nor have we a suggestion that they have ever migrated. There was a country—not a people—called Su-li, but the phonetic element here is Sulak, and we must identify the district with the Surak of the Bundahish, the country about the lower Jaxartes. The later writers, it is true, talk of a kingdom—not a people—called by Matwanlin Sse; but it is, apparently, the modern Sarakhs. The classical Sacae, Scyths and Dahae seem to be variations of the one word, and may be connected with the Tochari of Strabo the Tahia of the Chinese. I am, however, doubtful of Scyth or Sacae being used by the Greeks in any sense as an ethnographic term; rather it applies to their stage of civilisation. We learn very little of these Tokhars from Chinese sources, but from Strabo we gather that they, in conjunction with the Wusuns and the Sakarauli (possibly the inhabitants of the Sarik-kol Pamir), bore down on Bactria and put an end to the Greek line of kings. About the same time the Yueh-ti, driven from their homes by the Hiung Nu (Turks), arrived in the country, and the two peoples seem to have more or less coalesced, and we find them a few years later living in apparent harmony, but occupying each its own side of the Oxus, the Yueh-ti apparently being the predominant race, or at least supplying the royal race. This is very different from the account given by his supposed authorities to Dr. Haddon. I have had the misfortune to have met with M. Drouin before, but now become acquainted with

¹ T'sing, the word used, means the colour of deep, pure water—grey, blue or green.

M. Ujfalvy for the first time. Apparently these authors have gathered their ideas from the French writers of the last century, whose knowledge of Chinese was confined to such works as the *Bunghien Kangnu*, or even later works of about as much authority as Rollin's "Universal History."

A good deal of interest attaches to the Yueh-ti. Their original name was possibly Viddhal, and they seem to have had some prehistoric connection with the Yādavas, who took part in the Indian immigration. There never was any doubt about their being the same people afterwards known to Greeks and Arabs as Ephthalitæ and Haithals respectively. With the Yueh-ti were associated in ancient Chinese legend the Mats, or Mat-su, apparently Maddhals, as in Indian lore Maddhu is associated with the Yādavas, and this brings us to the later branch of the Yueh-ti, who in these authors by a strange mistake are called Yetha. Really the name in modern Chinese is Yenta, a very different sound. In the old language it was I'm-dat. Where the first syllable appears frequently doing duty as merely the initial *m*, Da, or rather Dat, where final *t* represents *l*, stands then for Maddhal. This subtribe seems about the fifth century to have been settled in the neighbourhood of Bamian, and, except that it was less civilised than the other branches of the family, to have had little to distinguish it.

Both Greek and Chinese authors concur in describing these Ephthalites as being distinctly blond, with full beards, of a handsome type, and of lively manners. Menander calls the king under whose guidance they crossed the Hindukush Catulphus, at whose Teutonic aspect Colonel Yule expresses surprise. The Chinese, however, name him Kitolo, evidently the same word; most Chinese names consisting of only three words, the remainder is generally omitted in the transliteration of foreign names. Catulphus is, however, evidently the nearest Greek equivalent for Gothic Caedwulf. These allied peoples went amongst the Indians by the common appellation of Hunas, whence the alternative Greek name of White Huns, which has no connection whatever with that of the European Huns of the fourth century, whose swarthy complexions and hairless faces indicate a very different origin. These apparent Gothic connections are not confined to the Ephthalites, but occur throughout, the leader of the Scythians, *ék rîs 'Aôlas*, i.e. Wusuns, whom Alexander defeated outside Kyropolis, was, according to Arrian Satrakes, the Greek equivalent for Gothic Sietrich.

Of Dr. Haddon's Hoa, evidently derived from some mistaken French transliteration, I cannot even guess the origin. There is no such name to be found in the earlier and more authentic Chinese writers. Dr. Haddon is, however, quite correct in identifying the modern Chinese Yuan yoan, or Jwan Jwan, with the Avars of Gibbon.

Dr. Haddon expresses some surprise at the beardless faces of the later Huna kings; from the appearance of the king depicted on the coin, and its overhanging brows and prominent nose, he certainly did not belong to the smooth-faced races of the extreme north and east of Asia. So we may be sure that the bareness was artificial; it was probably the fashion of the time to shave.

With regard to the type of face and skull represented on the coin of Jayatu Mihirakula, I may remark that I met last night at dinner a gentleman of whom it might be called a portrait. I may describe him almost in Dr. Haddon's words as: Nose large, jaw powerful, neck fleshy, the occipital region of the head deficient, the vertex produced into a truncated cone. This remarkable shape was in his case quite natural. Moreover, with the exception of a moustache his face, as in the coin, was hairless. He had similar overhanging eyebrows, a like marked notch at the bridge of the nose, and an almost identically aquiline nose. His eyes, however, were not oblique, nor had he the slightest trace of the "Tatar," nor did he in any way approach the "Mongolian" type. The gentleman is, in fact, a Parsee of the highest type, polished and affable.

Shanghai, China, March 13. THOS. W. KINGSMILL.

Graphic Solution of the Cubics.

THE note by Mr. T. Hayashi, published in NATURE of March 28, suggests to me the following little historical remark. The method given by Mr. Hayashi for the cubics is due to Monge, "Correspondance sur l'École impériale polytechnique," par M. Hachette, vol. iii. p. 201; "Solution graphique de l'équation du troisième degré, $x^3 - px + q = 0$," par M. Monge.

"L'équation proposée résulte de l'élimination de y entre les deux $y = x^3$, $y = fx + g$; l'une est la parabole cubique, . . .

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l'autre représente une droite. . . . Ayant construit ces deux lignes, les abscisses x des points où elles se coupent, sont évidemment les racines de l'équation proposée."

Monge gives also a practical construction of the curve on a small sheet of paper *Nil sub sole novi!* G. VACCA.
Via Bogino, 4, Torino (Italy).

THE WORK OF THE NATIONAL ANTARCTIC EXPEDITION.

THE final programme of the scientific work of the National Antarctic Expedition had not been arranged at the date of my departure from England, as the Joint Committee of the Royal Society and the Royal Geographical Society had not issued its full instructions as to the route and plan to be adopted. A provisional summary may, however, be useful by calling forth suggestions while there is yet time to use them.

FIELD OF OPERATIONS.

It is, perhaps, hardly necessary to remark that it is not the object of the expedition to reach the South Pole, but to investigate the Antarctic regions; and though some of the problems cannot be solved unless the existing southern record is broken, the expedition is not being equipped especially for the attainment of much higher latitudes than have already been reached. Had that been one of the main objects of the expedition, either the ship might have been sent southward on a different line, or the expedition would have been provided with greater sledge-hauling power.

The operations of the British expedition are restricted to the half of the Antarctic area east of the meridians of 90° E. and 90° W., i.e. to the region south of Australia and the Pacific. The western half, including the region south of America, the Atlantic and Africa, is to be explored simultaneously by the German expedition under Prof. von Drygalski, by a Swedish expedition under Dr. O. Nordenskjöld, and, it is hoped, also by a Scotch expedition under Mr. W. S. Bruce. This division of the field of work between the British and German expeditions was proposed at the Geographical Congress at Berlin, and has now been accepted on both sides and the plan of work arranged accordingly. So far as can be judged with our present knowledge, this plan, other things being equal, gives the German expedition the chance of the most striking geographical discoveries and the British expedition the opportunities for a richer harvest of scientific results.

The scientific work of the expedition is directed to cover as wide a field of research as is consistent with the essential objects of the expedition. Of these the object of primary importance is the study of terrestrial magnetism. It was upon the need for work upon this subject that the appeal to the Treasury for funds was based, and it was to enable the magnetic observations to be properly made that it was thought advisable to provide a new ship rather than adopt the less expensive course of adapting an existing whaler. A new ship—the *Discovery*—has accordingly been built by the Dundee Ship-building Co. She is a modified whaler of somewhat more than 1500 tons displacement, and with engines of 450 horse power.

The staff of the expedition is as follows:—The executive staff consists of Commander R. F. Scott, R.N., commander of the expedition; Lieutenant Albert Armitage, R.N.R., who distinguished himself in the Jackson-Harmsworth expedition to Franz-Josef Land, second in command and navigator; Lieutenants Royds, Barne and Shackleton; and Mr. Skelton, engineer. The civilian staff consists of Mr. T. V. Hodgson, formerly of the Plymouth Biological Laboratory and curator of the Plymouth Museum, biologist; Dr. R. Koettlitz, botanist; Mr.