

pearance of the line of demarcation between organic and inorganic compounds; for here we derive what may truly be considered as an inorganic compound from a substance so purely organic as an ethereal salt.

IN our chemical note of last week the experiments of Dr. Merz upon magnesium nitride, Mg_3N_2 , were described. It will be remembered that magnesium was shown to combine with nitrogen in a most vigorous manner when heated to redness in a stream of the gas. M. Ouvrard, in the current number of the *Comptes rendus*, shows that lithium too combines energetically with nitrogen. A quantity of this metal was placed in a small boat constructed of iron, the only convenient substance which will withstand the action of fused lithium, and the boat was placed in a combustion tube through which a stream of nitrogen was driven. Upon gradually raising the temperature of the tube and contents, a point was attained, in the neighbourhood of low-redness, when combination suddenly occurred, the metal becoming brilliantly incandescent and increasing rapidly in volume, while the nitrogen in the apparatus was almost entirely absorbed. On continuing the stream of nitrogen until the apparatus became quite cold, the lithium nitride was found in the form of a black spongy mass. Its composition was proved by analysis to be Li_3N , analogous to magnesium nitride, Mg_3N_2 , and to ammonia, H_3N . Indeed, it may readily be converted into the latter gas by heating it in a stream of hydrogen. It behaves with water very similarly to magnesium nitride, at once decomposing that liquid with liberation of large quantities of ammonia and formation of a solution of lithia.

THE additions to the Zoological Society's Gardens during the past week include two Macaque Monkeys (*Macacus cynomolgus* ♂ ♀) from India, presented respectively by Mr. B. H. Heald and Mrs. E. Day; a Rhesus Monkey (*Macacus rhesus*) from India, presented by Mr. Alfred J. Hayward; two Common Squirrels (*Sciurus vulgaris*), British, presented by Master Fred Corfield; two Ring-necked Parrakeets (*Palaeornis torquatus*) from India, presented by Miss Heinekey; six Mantell's Apteryx (*Apteryx mantelli*) from New Zealand, deposited.

OUR ASTRONOMICAL COLUMN.

WOLF'S NUMBERS FOR 1891.—*Comptes rendus* for January 18 contains a communication by M. Rodolf Wolf on the state of solar activity in 1891. The following table shows the results of solar observations made at Zurich Observatory, and magnetic observations made at Milan. The relative numbers (*r*) have been obtained by the method used in previous years.

1891.	r.	Increments on the relative numbers in 1890.	Variations of magnetic declination.	Increments on the variations of declination in 1890.
January ...	17.1	11.0	3.71	0.69
February ...	23.0	22.1	4.51	-0.30
March ...	10.0	4.7	7.85	0.36
April ...	19.4	17.9	10.58	1.90
May ...	43.2	38.6	10.70	3.00
June ...	48.7	47.3	10.36	1.52
July ...	59.1	47.7	10.98	2.41
August ...	32.6	24.9	9.96	1.96
September ...	52.1	35.4	8.55	1.45
October ...	50.4	39.3	8.49	-0.23
November ...	41.0	33.8	4.73	1.63
December ...	30.6	23.4	8.85	0.31
Means...	35.6	28.8	7.77	1.22

The relative numbers and the magnetic variations show a decided increase on the values obtained for 1890, and the parallelism between the two series continues as in former years. A discussion of these and previous results indicates that the last minimum of solar activity has the date 1889.6.

A NEW JOURNAL.—The *Sidereal Messenger* has ceased to exist under this title, and has merged into *Astronomy and Astro-Physics*. The first copy of this new journal has recently been published in America. Its production is the natural result of the development of astronomical physics. One portion of the journal is to be devoted to general astronomy, whilst the other deals with astro-physics. The editor of the former is Mr. W. W. Payne, who so ably conducted the *Sidereal Messenger*, and the latter section is under the charge of Prof. G. E. Hale, whose excellent works on solar prominence photography are known to all spectroscopists. If the editors can fill future numbers of the journal with so many interesting and important articles and notes as make up the first number, they will attain a well-deserved success. Many of the articles have been published in other journals, but this, of course, does not in the least detract from the value of the new journal. The literature of spectroscopy is truly said to be widely scattered, and Prof. Hale is doing a meritorious work in bringing it all together.

KOREA.

AT the meeting of the Royal Geographical Society on Monday night, the paper read was on a journey through North Korea to the Ch'ang-pai Shan, by Mr. Charles W. Campbell. Ch'ang-pai Shan, or "Ever White Mountain," is the same as Peik-tu San, or White Head Mountain, and "The Long White Mountain," so graphically described by Mr. James in his book of that title. It lies in Manchuria, just beyond the Korean boundary, and is remarkable for the deep-blue lake which lies in a deep hollow on the ridge joining two of its peaks. It was not till August 1889 that Mr. Campbell succeeded in leaving Seoul, the capital of Korea. He journeyed east and north along the coast. The country traversed is typical of the centre and north of the country.

"Korea," Mr. Campbell said, "is a land of mountains. Go where you will, a stretch of level road is rare, and a stretch of level plain rarer still. The view from any prominent height is always the same; the eye ranges over an expanse of hill-tops, now running in a succession of long billowy lines, now broken up like the wavelets in a choppy sea, often green with forest, but just as often bare, brown, and forbidding. Clear mountain brooks or shallow streams rushing over beds of gravel are never wanting in the valleys below, where a rude log bridge, or curling smoke, or the presence of cultivation, leads you to observe the brown thatch of some huts clustered under the lee of a hill. These hamlets are of two distinct kinds—the purely agricultural, and those which depend as much on the entertainment of travellers as on farming. The site of the agricultural village is a hill-slope facing the south. Over this, low, mud-walled, straw-thatched hovels, each standing in its own patch of garden, which is protected by a neat fence of interlaced stems, are scattered at random, and there is not much attempt at a street anywhere. Every house has its threshing-floor of beaten clay, the workshop of the family. The stream which runs past the foot of the hill, or courses down a gully in its side, is lined with women and girls washing clothes with sticks instead of soap, preparing cabbages for pickle, or steeping hemp. Seen from a distance, these places are quite picturesque. The uneven terraces of thatch are brightened by the foliage and flowers of gourds and melons which climb all over the huts. In the gardens surrounding each house are plots of red chilli, rows of castor-oil plants, and fruit trees, such as peach, apricot, pear, and persimmon.

"The roadside village, on the other hand, is generally a most unlovely spot. The only street is the main highway, which is lined on both sides by a straggling collection of the huts I have mentioned. Heaps of refuse, open drains, malodorous pools, stacks of brushwood for fuel, nude sun-tanned children disporting themselves, men and women threshing grain, and occasionally a crowd of disputants, all combine to make it a very indifferent thoroughfare. Most of the houses are inns or eating-shops. The main gate of the inn leads directly from the street into a quadrangle bounded on two sides by open sheds, which are provided with troughs for the feeding of pack animals, and on the other two sides by the guest rooms and kitchen. The courtyard is untidy, often dominated by a powerful pig-stye, and littered with fodder or earthenware pitchers and vats, whose contents are usually the strong-smelling pickled cabbages and turnips so dear to Korean stomachs.

"The main industry, of course, is agriculture, carried on under

disadvantages inseparable from the mountainous character of the country. In Japan and China we know that persevering care and energy have overcome similar disadvantages, but it is not so in Korea. The terrace cultivation, the irrigation works, and above all the patient, almost fastidious labour, which make the hills of Japan and South China yield their share of the earth's good fruits, are practically unknown. Where water is abundant and easily manageable, the lower reaches of the valleys are taken up with rice, the higher portions with millet, beans, buckwheat, &c. A particularly favourable slope, all the better if it faces the south, is usually as much as the sides of the valley are called upon to contribute to cultivation. There is considerable waste about the paths and paddy-dykes, weeds are rank and numerous, and the prim neatness so conspicuous in Japanese farming is entirely wanting. Much of the newly broken ground is naturally stony, and little effort is exercised to make it less so. However, considering the small amount of labour expended on agricultural operations, the crops are good, and speak eloquently for the fertility of the soil."

Mr. Campbell reached the River Yalu in October, and although he made every endeavour to reach his goal, the snow was so deep, the passes so overhung with accumulations of snow, and his guides so terrified, that he was compelled to turn back when within a mile or two of the summit. Nevertheless, he succeeded in making observations of considerable interest.

"Peik-tu San, or Lao-pai Shan (Old White Mountain) as it is at present called by the Chinese of Manchuria, is the most remarkable mountain, naturally and historically, in this part of Asia. The perennial whiteness of its crest, now known to be caused by pumice when not by snow, made the peoples that beheld it from the plains of Manchuria give it names whose meanings have survived in the Chinese *Ch'ang-pai Shan*, or Ever White Mountain. This designation, obviously assigned to the White Mountain alone, has been extended to the whole range without apparent reason, for no other peak of it, so far as is known, can pretend to perpetual whiteness, whether of pumice or snow. Some 100 miles south-east of Peik-tu San there is a Ch'ang-peik San (Ever White Mountain) which must approach, if it does not exceed, the White Mountain in height, but the Koreans do not credit it with a snowy covering for more than nine months of the year, and a European traveller who has seen it informs me that it is wooded to the summit, quite unlike Peik-tu San, which is bare of forest for the last 1000 feet of its height. The great point of interest in the mountain, apart from its whiteness, is the lake—12 miles in circuit according to Mr. James and his party, the only Europeans who have seen it—which lies in the broad top of the mountain at a height of 7500 feet above sea-level, and is supposed to be the source of the three rivers, Yalu, Tumen, and Sungari. The *Tei Tei-ki*, Great Lake, as the Koreans call it, is the nucleus of a mass of legend and fable. It is a sacred spot, the abode of beings supernatural, and not to be profaned by mortal eye with impunity. Curiously enough, neither Chinese nor Koreans have the faintest notion of the real character of Peik-tu San. The Chinese say that the lake is an 'eye of the sea,' and the Koreans tell you that the rock of which the mountain is composed floats in water, for lumps of pumice were common on the Yalu at Hyei-san." Mr. Campbell's crude geological explanations, that this *cho-san* (ancestral mountain) of Korea was a burnt-out volcano, whose crater had been filled with water by springs, were listened to with polite wonder, and treated with much less credulity than they deserved. He pointed to the black dust, to the clinkers, and to the rocks lining the banks of the Yalu for miles, many of which looked as if they had been freshly ejected from some subterranean furnace, but to no purpose. If the occurrences he spoke of had taken place, they must have been handed down by tradition; and it was useless to cite lapse of time—Koreans are ignorant of geological periods—to people whose history extends as far back as 4000 years ago. According to Mr. Campbell's observation, most of the forest between Po-ch'ön and Peik-tu San grows on volcanic matter, which was without doubt ejected from Peik-tu San during successive eruptions. The general inferiority of the timber hereabouts to that which he saw elsewhere in Korea led him to examine the soil wherever an uprooted tree or a freshly-dug deer-pit furnished the opportunity. "Beyond a thin coating of leaf-mould on the surface, there was seldom anything else but pumice, broken to the size of a very coarse sand." According to the hunters, this was the subsoil everywhere in the forest, and to my knowledge it extends for forty miles at least to the south from Peik-tu San.

Nearing the mountain we get the clearest evidence of the character and recency, geologically speaking, of the eruptions which spread this vast quantity of volcanic material over such a wide area. Ten miles due south of the White Mountain, the Yalu, now 8 or 10 yards broad and very shallow, flows between banks like a railway-cutting, sheer, clean, and absolutely devoid of vegetation, for denudation was too rapid to permit the slightest growth." The sections thus exposed were often over 100 feet in depth, and at one of the deepest portions Mr. Campbell counted thirteen layers of black volcanic dust, all varying in thickness, and each separated from the layer above by a thin layer of light-coloured mould. So fine was this dust that the least breath of wind caught it and scattered it freely over the adjoining snow, to which it gave a grimy, sooty appearance.

"The forests of South Manchuria, though uninhabited now, were, we learn from Chinese records, the home of many races in ages past. The comparatively recent kingdom of Ko-ku-rye, which arose in the first century B.C., is said to have occupied the Ch'ang-pai Shan and the head-waters of the Yalu river. Anyone who has travelled through the forests might be inclined to doubt such records, for, excepting hunters' lodges, one never notices a vestige of human occupation. But it must be remembered, on the other hand, that the word *kuk* (Chinese *kuo*), country or kingdom, was applied in the early history of Korea and Manchuria to very limited communities, often to mere villages. The word "tribe" better expresses what the so-called kingdoms actually were; and when we bear in mind their low civilization and the impermanent character of their dwellings, it is not surprising that my hasty journey failed to throw any light on the ancient inhabitants of these forests." Since his return, however, Mr. Campbell was informed by Mr. Fulford that Chinese hunters told him of the discovery by them of human implements—of what kind Mr. Campbell cannot say—when digging deer-pits near the White Mountain.

Mr. James, in a paper read before the Royal Geographical Society in June 1887, described very fully the guild of hunters which practically owns and rules the forests to the north and west of Peik-tu San. The Koreans have no such guild, probably because they have not so much to fear from bandits, but each hunter has a recognized right of ownership over a rudely defined district in the neighbourhood of his hut. Over this he hunts and traps deer in summer, and sable at the beginning of winter, altogether spending about five months of the year in the forest; the remaining seven are passed at his home on or near the Yalu, either tilling his ground or living in idleness on the proceeds of hunting seasons. Besides sable and deer, tiger, leopard, bear, pig, and ermine are found here; bear, probably the common brown species (*Ursus arctos*), are said by the hunters to be very numerous in summer. In mid-Korea Mr. Campbell has seen a small black bear with a white patch on his chest (*Ursus tibetanus*), but the Yalu trappers did not seem to know it. Hazel-grouse were the only game-birds he noticed. Throughout the forests insect pests abound in the summer months. Mosquitoes, gnats, and gad-flies make the lives of the settlers perfectly burdensome for two or three months of the year, and ponies and bulls quickly succumb to their attacks. The houses are kept constantly filled with birch-smoke to drive them off; cattle are protected by fires of greenwood in the open; and men working the clearings carry coils of rope made from dried *Artemisia*, which burns slowly and emits a pungent odour, for the same purpose.

THE GEOLOGY OF THE HIMALAYAS.

THE twenty-third volume of the Memoirs of the Geological Survey of India, consisting of some 250 pages, is wholly taken up by an account of the geology of the Central Himalayas, by the Superintendent of the Survey, Mr. C. L. Griesbach, C.I.E. The carefully written text is illustrated by some of the most exquisite and instructive photographs of synclinals, folded beds, faults, glaciers, &c., which have ever been produced, to say nothing of the numerous maps and sections.

We have thought it best to give Mr. Griesbach's conclusions on the important subject with which he deals in his own words:—

The Himalayan region forms part of the vast structure of the Central Asian elevation; it is so closely connected with the latter, both structurally and geographically, that it is very