

plan for utilising African elephants, to which we have before referred, is quite feasible.

At a meeting which was held at Palmerston, in the Northern Territory, on the arrival of Mr. Alexander Forrest's expedition from West Australia, Mr. Hill, the second in command, and the geologist of the party, stated that it was painful to think how little had been done in the way of prospecting for minerals. He believed that a search in the north and west portions of the territory would well repay the trouble and that there was more mineral wealth in the neighbourhood than was imagined.

M. BRAU DE ST. POL-LIAS, the originator of the "Colons-Explorateur" scheme, has communicated to the French Geographical Society a letter which he has received from Dr. Rück, a missionary in Sumatra, in which he furnished the geographical results of a journey in the Batak country. His examination of Lake Tebah shows that there is no river flowing out at the north-east, as has been previously supposed, and that, contrary to earlier statements, there is a river flowing out of the south end of the lake, which is thought to empty into the sea on the east coast of the island, though its course does not appear to have been examined so far at present.

THE French Government have entrusted M. Th. Lécart with a "gratuitous" mission to investigate the ornithology and entomology of the region between the Senegal and the Niger, and MM. Brau de St. Pol-Lias and E. de Lacroix to collect ethnographical specimens in Sumatra.

M. SAVORGNAN DE BRAZZA, who is now on the west coast of Africa, has been entrusted by the French branch of the International African Association with the formation of their first station, which will probably be located on the upper waters of the Ogowé, where M. de Brazza has already made important geographical discoveries. Capt. Bloyet is to be the founder of the other station on the opposite side of the continent.

THE death at Ujiji is announced, of the French explorer, Abbe Debaize. The Abbe left Paris in March, 1878, with a subsidy of 10,000 francs from the French Government, to cross Africa, from Zanzibar to the west coast. He reached Lake Tanganyika in March of last year, after an unusually rapid and favourable journey. He intended to establish dépôts at the north end of the lake, and at the mouth of Stanley's Aruwimi, to explore the country between the lake and the Albert Nyanza, and the region to the north of the Congo. He had started on his journey, but was so badly treated by his followers, that he returned downcast to Ujiji, where he died. The Abbé was well qualified by his scientific knowledge and his experience for the task he undertook, and his death is a real loss to the scientific exploration of Africa.

MR. STANLEY, according to information received by the Lisbon Geographical Society, had reached the last fall of the Congo at Yallala, and was preparing the installation of the first Belgian commercial station on the right bank of that river.

MESSRS. SONNENSCHNEIN AND ALLEN have just published a "Primer of the Industrial Geography of Great Britain and Ireland," by Mr. G. Phillips Bevan. The Primer is likely to prove useful not only as a supplement to the ordinary school text-books, but to all who desire to have a knowledge of the geographical distribution of our multifarious industries.

THE Irkutsk mail informs us that M. Potanin returned on December 13 to that city. The results of his expedition are most important. He has thrown a quite new light on the geography and ethnography of North-western Mongolia. His assistant, M. Adrianoff, has made important geological explorations and obtained an interesting collection of ethnographical photographs. Besides, M. Orloff, who was sent to meet M. Potanin, has made several important surveys.

PERTHES, of Gotha, has issued on one large sheet an ingeniously tabulated and useful index to all the maps that have appeared in *Petermann's Mittheilungen*, from its first publication in 1855, down to the present. The index has been designed by Herr Bruno Hassenstein.

GEOLOGICAL NOTES

GEOLOGICAL SURVEY OF THE UNITED STATES.—Mr. Clarence King, the Director of the new Survey, has prepared his estimates for the appropriation of the \$330,000 voted by Congress for the year ending June 30, 1880. They show gene-

rally how he proposes to distribute the work under his superintendence:—

Geological survey of iron and coal resources of public domain ... ..	\$30,000
Extending observations on coal and iron into old States ... ..	20,000
Survey of agricultural geology on public lands of Mississippi Basin ... ..	25,000
Geological survey of gold and silver in Division of Rocky Mountains ... ..	35,000
Geological survey of gold and silver in Division of Great Basin ... ..	35,000
Survey of geological structure of public lands in Mississippi Basin ... ..	25,000
Survey of geological structure and classification of public lands of Rocky Mountains ... ..	30,000
Survey of geological structure and classification of public lands in Colorado Basin ... ..	40,000
Survey of geological structure and classification of public lands in Great Basin ... ..	30,000
Survey of geological structure and classification of public lands in Pacific ... ..	25,000
	\$330,000

It will be observed that this allotment of the funds quite confirms the view lately expressed in our columns (*NATURE*, vol. xxi. p. 197) as to the "scare" which some of the geologists in the east have experienced on the subject of a proposed invasion of the old States by the forces of the new Survey. We ventured to point out that in the west Mr. King and his associates had such a vast and untouched field for their labours that they were not very likely to betake themselves to the well-beaten geological pathways of the Eastern States. Mr. King in the foregoing estimates proposes to devote only \$20,000 for "extending observations on coal and iron into old States." Assuming that this item is inserted in good faith (and surely there is no reason to do otherwise), it must be regarded by impartial outsiders as reasonable and moderate. Probably the original intention was to secure power to prolong investigations from the public domain into surrounding States where this was required by the necessities of the service. No one will deny the propriety of such a provision. Even if the observations were to be extended into the Eastern States, so long as this was done merely with a view to acquiring information and experience to guide the field-operations in the Territories, it would surely still be within the province of any truly national Survey. That any serious attempt is contemplated to carry on ordinary geological surveying in the old States is simply inconceivable. So that again, in spite of their renewed protests, the geologists of the East may be urged to believe that they have the game in their own hands, and that they have no ground for alarm that the rights either of States or of private individuals will eventually suffer.

CATALOGUE OF OFFICIAL REPORTS OF AMERICAN GEOLOGICAL SURVEYS.—Mr. Frederick Prime, one of the assistant geologists in the Geological Survey of Pennsylvania, has just published, in the *Transactions of the American Institute of Mining Engineers*, a most useful catalogue of all the official reports issued up to the present time by the various geological Surveys of the States and Territories of the American Union, and of British North America. It thus forms a compendious guide to the official sources of information regarding almost all parts of North America, with the names of the authors and dates of publication.

THE PRIMEVAL CELL.—Some twelve years ago the petrographers and mineralogists of Germany were a good deal exercised in their minds by an escapade of one of their number—himself a very able mineralogist—who announced his discovery of a new microscopic fauna and flora in crystalline eruptive rocks, such as basalt and melaphyre. Of course, the presumed organic structures were repudiated by naturalists, and still remain characteristic products of the mineral kingdom. Another vagary of a similar kind has lately been perpetrated by Dr. Otto Hahn, who publishes a thin volume with a large series of plates, under the title of "Die Urzelle," in which he shows that everybody before him has unaccountably misunderstood the much discussed *Eozoon*, that it is neither a mineral nor an animal structure, but belongs to the vegetable kingdom! In the *eozoonal* limestones he finds numerous primæval sea-weeds, which, with paternal fondness, he takes care to have duly named. What a pity that

so much time, labour, and ingenuity had not been more usefully employed!

**MICROSCOPIC STRUCTURE OF SCOTTISH ROCKS.**—Students of petrography may be interested to know that Mr. Bryson, of Edinburgh, has prepared for sale a series of sections of typical Scottish rocks, which have been selected for him by Prof. Geikie. They illustrate some of the most characteristic aqueous, igneous, and metamorphic rocks of Scotland. They are thirty in number.

## MYTHOLOGIC PHILOSOPHY<sup>1</sup>

### II.

**RAIN.**—The Shoshoni philosopher believes the domed firmament to be ice, and surely it is the very colour of ice, and he believes further that a monster serpent-god coils his huge back to the firmament, and with his scales abrades its face and causes the ice-dust to fall upon the earth. In the winter time it falls as snow, but in the summer time it melts and falls as rain, and the Shoshoni philosopher actually sees the serpent of the storm in the rainbow of many colours.

The Oraibi philosopher who lives in a pueblo is acquainted with architecture, and so his world is seven-storied. There is a world below, and five worlds above this one. Muingwa, the rain god who lives in the world immediately above, dips his great brush, made of feathers of the birds of the heavens, into the lakes of the skies, and sprinkles the earth with refreshing rain for the irrigation of the crops tilled by these curious Indians who live on the cliffs of Arizona. In winter Muingwa crushes the ice of the lakes of the heavens, and scatters it over the earth, when we have a snow-fall.

The Hindoo philosopher says that the lightning-bearded Indra breaks the vessels that hold the waters of the skies with his thunderbolts, and the rains descend to irrigate the earth.

The philosopher of civilisation expounds to us the methods by which the waters are evaporated from the land and the surface of the sea, and carried away by the winds and gathered into clouds, to be discharged again upon the earth, keeping up for ever that wonderful circulation of water from the heavens to the earth and from the earth to the heavens, that orderly succession of events in which the waters travel by river, by sea, and by cloud.

**Migration of Birds.**—The Algonkin philosopher explains the migration of birds by relating the myth of the combat between Ka-bi-no-ke and Shingapis, the prototype or progenitor of the water-hen, one of their animal gods. A fierce battle raged between Ka-bi-no-ke and Shingapis, but the latter could not be conquered.

All the birds were driven from the land but Shingapis, and then was it established that, whenever in the future Winternaker should come with his cold winds, fierce snows, and frozen waters, all the birds should leave for the south except Shingapis and his friends. So the birds that spend their winters north are called by the Algonkin philosophers "the friends of Shingapis."

In contrast to this explanation of the flight of birds may be placed the explanation of the modern evolutionist, who says that the birds migrate in quest of abundance of food and a genial climate, guided by an instinct of migration which is a cumulation of inherited memories.

**Diversity of Languages.**—The Kaibabit philosopher accounts for the diversity of languages in this manner: Si-chom-pa Ma-so-its, the grandmother goddess of the Sea, brought up mankind from beneath the waves in a sack, which she delivered to the Shinau-av brothers, the great wolf-gods of his mythology, and told them to carry it from the shores of the sea to the Kaibab Plateau, and there to open it, but they were by no means to open the package ere their arrival, lest some great disaster should befall.

The curiosity of the younger Shinau-av overcame him, and he untied the sack and the people swarmed out, but the elder Shinau-av, the wiser god, ran back and closed the sack while yet not all the people had escaped, and they carried the sack with its remaining contents to the plateau and there opened it.

Those that remained in the sack found a beautiful land, a great plateau covered with mighty forests, through which elk, deer, and antelopes roamed in abundance, and many mountain sheep were found on the bordering crags; *pine*, the nuts of the edible pine, they found on the foot-hills, and *use*, the fruit of the

*Yucca*, in sunny glades, and *nant*, the *meschal* crowns, for their feasts, and *chuar*, the cactus-apple, from which to make their wine; reeds grew about the lakes for their arrow-shafts; the rocks were full of flints for their barbs and knives, and away down in the cañon they found a pipestone quarry, and on the hills they found arrarumpive, their tobacco.

Oh! it was a beautiful land that was given to these, the favourites of the gods. The descendants of these people are the present Kaibabits of Northern Arizona. Those who escaped by the way, through the wicked curiosity of the younger Shinau-av, scattered over the country and became Navahoes, Moquis, Sioux, Comanches, Spaniards, Americans—poor, sorry fragments of people, without the original language of the gods, and only able to talk in imperfect jargons.

The Hebrew philosopher tells us that on the plains of Shinar the people of the world were gathered to build a city and erect a tower, the summit of which should reach above the waves of any flood Jehovah might send. But their tongues were confused, as a punishment for their impiety.

The philosopher of science tell us that mankind was widely scattered over the earth anterior to the development of articulate speech, that the languages of which we are cognisant sprang from innumerable centres as each little tribe developed its own language, and that in the study of any language an orderly succession of events may be discovered in its evolution from a few holophrastic locutions to a complex language, with a multiplicity of words and an elaborate grammatic structure, by the differentiation of the parts of speech and the integration of the sentence.

**Mythologic Philosophy has Four Stages.**—Mythologic philosophy is the subject with which we deal. Its method, as stated in general terms, is this: All phenomena of the outer objective world are interpreted by comparison with those of the inner subjective world. Whatever happens, some one does it. That some one has a will, and works as he wills. The basis of the philosophy is personality. The persons who do the things we observe in the phenomena of the universe, are the gods of mythology—the *cosmos* is a *pantheon*. Under this system, whatever may be the phenomena observed, the philosopher asks, "Who does it? and why?" and the answer comes, "A god with his design." The winds blow and the interrogatory is answered, "Æolus frees them from the cave to speed the ship of a friend, or destroy the vessel of a foe."

The actors in mythologic philosophy are gods. In the character of these gods four stages of philosophy may be discovered. In the lowest and earliest stage everything has life, everything is endowed with personality, will, and design; animals are endowed with all the wonderful attributes of mankind; all inanimate objects are believed to be animate; trees think and speak; stones have loves and hates; hills and mountains, springs and rivers, and all the bright stars have life. Everything discovered objectively by the senses is looked upon subjectively by the philosopher and endowed with all the attributes supposed to be inherent in himself. In this stage of philosophy everything is a god. Let us call it *hecatostheism*. In the second stage men no longer attribute life indiscriminately to inanimate things, but the same powers and attributes recognised by subjective vision in man are attributed to the animals by which he is surrounded. No line of demarcation is drawn between man and beast; all are great beings endowed with wonderful attributes. Let us call this stage *zooltheism*, when men worship beasts. All the phenomena of nature are the doings of these animal gods; all the facts of nature, all the phenomena of the known universe, all the institutions of humanity known to the philosophers of this stage, are accounted for in the mythologic history of these zoomorphic gods.

In the third stage a wide gulf is placed between man and the lower animals. The animal gods are dethroned, and the powers and phenomena of nature are personified and deified. Let us call this stage *physitheism*. The gods are strictly anthropomorphic, having the form as well as the mental, moral, and social attributes of men. Thus we have a god of the sun, a god of the moon, a god of the air, a god of dawn, and a deity of the night. In the fourth stage, mental, moral, and social characteristics are personified and deified. Thus we have a god of war, a god of love, a god of revelry, a god of plenty, and like personages who preside over the institutions and occupations of mankind. Let us call this *psychotheism*. With the mental, moral, and social characteristics in these gods are associated the powers of nature, and they differ from nature gods, chiefly in that they have more distinct psychic characteristics. Psychotheism

<sup>1</sup> From Vice-Presidential Address of Prof. J. W. Powell, of Washington, Vice-President Section B, American Association for the Advancement of Science, Saratoga Meeting, August, 1879. Continued from p. 314.