science, there can be no question. In a splendid building and surrounded with all the appurtenances of precedent and dignity, months and years are wasted in a game of finding weak points in arguments relating to subjects many of which are of doubtful national importance; while the scientific elect of the country are crowded in modest apartments to discuss discoveries which it has cost them much time and frequently much money to complete, and for the publication of which they must themselves make provision. It requires the satire of a Swift to describe the disparity of support afforded to polemics and natural philosophy by a State that owes most of its modern advance to scientific work.

There is no doubt that the greatest contributions to knowledge have been made by men who undertook their inquiries into Nature without thought of proximate or ultimate practical application or pecuniary reward. It is true also that the best kind of scientific investigation cannot be carried on in an atmosphere of commercialism, or where personal profit is the end in view. This, however, does not relieve the nation of the responsibility for seeing that the rare aptitude for original research receives the most generous encouragement. At present a scientific career is the last into which a man should enter who expects a reasonable reward for his knowledge and industry; for it is the least lucrative of all professions. The reason is that its members do not form a corporate professional body to secure for science the position which it should hold in the thought and affairs of the State; therefore, administrators and officials generally pay little attention to its claims. Scientific men should see that fuller national recognition is given to their work, and the programme in *Science Progress* will show some of the directions in which they may well effect improvements, so that the world shall recognise "the great principle that of all forms of human effort, those efforts which result directly in discovery, whether in science or in art, are by far the most important efforts for humanity."

R. A. GREGORY.

EXPLORATIONS ON THE NORTH-EAST FRONTIER OF INDIA.

AMONGST the many activities of the Indian Survey Department not the least in scientific interest is the series of exploratory surveys which have been carried out on the north-east frontier, to the north and east of Assam, in the wild and mountainous hinterland which lies between Tibet and Burma. The scientific interest of these explorations is two-fold, geographical and ethnographical. The region dealt with in the report of Colonel Sir Sidney Burrard (Surveyor-General of India) embraces the principal basins of the rivers Mekong, Salween, and Irrawaddy and the Himalayan catchment areas of the four principal feeders of the Brahmaputra, namely, the Lohit (Zayul), the Dibang, the Dihang, and the Sabansiri, and for the sheer physical difficulties

offered to systematic mapping is probably unmatched by any equal area in the world.

The scantiness of population, denseness of jungle, altitude of ranges, steep precipices, torrential streams and infernal climate have so far practically barred communication between India and China and between Tibet and Burma. It is here that four survey detachments have been working intermittently from 1911 to 1914 to assist each other in cracking that old geographical nut which lay enshrined in the mountains which overhang the course of the Brahmaputra and the sources of the Irrawaddy. We have heard of the remarkable exploits of geographers, such as Captain Bailey, who traversed those regions with unexampled success and vindicated the reputation of earlier native explorers, but we have not heard much of the determined efforts of the official pioneers of scientific mapping, whose work furnishes the basis of all successful explorations.

The scientific interest of work accomplished in the field of geography is naturally great and varied, for it is comprised in a large field of 28,000 square miles of hitherto unknown and unmapped mountains. Perhaps the chief point which calls for recognition is the discovery of a gigantic snow peak (Namcha Barwa), 25,445 ft. in altitude, far to the east of Kinchinjunga. The discovery of a peak in Assam nearly as high as Nanda Devi (25,645 ft.) "marks an epoch," says Col. Burrard, "in the history of Himalayan explorations," and the further fact that the Brahmaputra cuts its passage across the Himalayas at the base of this mountain gives rise to a curious problem in mountain hydrography; for it is noteworthy that the Sutlej, the Indus, and the great river of Hunza all cut through main ranges close to the points of supreme elevation of those ranges. Is this only a coincidence, or are we to seek for a reason in the processes of construction of mountain chains?

Another interesting matter is the absence of falls in the Brahmaputra. This is a feature common to most, if not all, of the great Himalayan rivers which descend rapidly from great altitudes to the plains. There are, indeed, magnificent cascades throughout the Himalayas, and a tremendous drop is not uncommon at the point where a tributary joins its parent river, but there are no falls in the main streams.

As for the ethnographical interest of the regions under review, it is so extensive and embraces such a variety of problems that it is only possible to point out generally that here, if anywhere, are we to find the modern representatives of the very oldest of primeval Asiatic races. We are content to generalise under such terms as Tibeto-Burman, or Indo-Chinese, a vast aggregation of tribespeople who differ so widely in their social idiosyncrasies, and even in anthropological features, that there must almost certainly be amongst them survivals who can help point the way to the very beginning of the human alphabet in Asia. All information that can be obtained about them, about their physical conditions, their habitat,

their manners, methods and creeds, is of the greatest scientific value—all the greater that, as civilisation advances, opportunities for the careful study of these people will surely diminish. It is indeed the human interest in exploration which now specially calls for the attention of geographers, for such slight glimpses as we can get into the earliest stages of human existence are getting less and less. They are rapidly passing away, whilst the great wide spaces of unexplored world-surfaces where humanity is not, and never was, can well await the geographer of the future.

T. H. HOLDICH.

POTASSIUM SALTS AND AGRICULTURE.

ONE of the first results of the European War was to cut off the supply of potassium salts, which play a large part as fertilisers in modern agriculture. Our crops of potatoes and our supplies of milk are particularly dependent on abundant supplies of these particular fertilisers, and practically all the world's supply has hitherto come from the Stassfurt deposits in Germany.

The three crops that stand most in need of potassic fertilisers are potatoes, mangolds (used for dairy cows), and sugar beets. In addition, two types of soil need them for other crops: light sandy soils and peaty soils. Enormous amounts are required in Germany, where vast areas of these two types occur, and where sugar beets and potatoes are largely grown; in Sweden for the same reasons; in France and the United States for the production of sugar beets; and in this country for mangolds and potatoes. It is not surprising, then, that nearly ten million metric tons per annum are consumed.

Fortunately the conditions in British farming are such that potassic fertilisers are not indispensable, at any rate for two or three years. Potassium salts form insoluble combinations in the soil, and do not wash out; any excess not removed by the crop is therefore in safety. Further, a considerable proportion of what is absorbed by the crop finds its way back to the soil in farmyard manure, the materials sold off the farm not as a rule containing much potash. The supplies stored in the soil can be utilised to advantage by a suitable dressing of lime or chalk, which displaces the potassium from its insoluble combinations, and also by addition of sodium chloride, which has the same effect and in addition economises the consumption of potassium by the plant.

But there are sources still open to the farmer. Seaweed contains considerable quantities of potassium, which would become available on a proper reorganisation of the kelp industry on modern lines. The farm itself can also supply something. At this time of the year a good deal of hedge cleaning has to be done to make a clear way for the plough, while later on the hedges have to be cut back to keep them sufficiently low. The material is very bulky, and has to be burnt straight away; it yields an ash found at Rotham-

sted to contain about 10 per cent. of potash (K_2O), which is thus nearly as rich as kainit (12.5 per cent. K_2O). The hedges from each ten acres of land yield about 1 cwt. of ash, so that a 300 acre farm—quite a usual size for a holding—could provide itself with about 30 cwts. per annum if all could be collected. Unfortunately collection is a matter of some practical difficulty excepting in fine dry weather.

Taking all circumstances into consideration, however, it does not appear that British agriculture will suffer for two or three years from potash starvation, though when conditions become more normal the farmer will no doubt be glad enough to replenish the stocks in his manure shed and his soil. Up to the present it does not appear that any other of the common fertilisers will be cut off through the war. Indeed, the tendency is all the other way, and some of the supplies usually shipped to the Continent are now available for use in this country.

E. J. R.

NOTES.

THE anniversary dinner of the Royal Society, usually held on St. Andrew's Day, November 30, will not be held this year.

THE following have been elected officers of the Cambridge Philosophical Society for the ensuing session, 1914-15:—*President*: Prof. Newall. *Vice-Presidents*: Dr. Barnes, Prof. Seward, Dr. Shipley. *Treasurer*: Prof. Hobson. *Secretaries*: Mr. A. Wood, Mr. F. A. Potts, Mr. G. H. Hardy. *New Members of the Council*: Mr. J. A. Crowther, Mr. H. H. Brindley, Dr. Fenton, Mr. H. Hamshaw Thomas.

ACCORDING to the Christiania correspondent of the *Morning Post*, a monument in the form of a monolith 15 ft. high has just been completed at Christiania and is intended to commemorate the gallantry of the late Captain Scott and his companions in their Antarctic expedition. It has been subscribed for by Norwegian friends of the explorer. On the front are inscribed the names of Captain Scott and those who died with him, while at the back is a short record of the expedition.

A CASE is recorded in the daily papers of a soldier who, during a recent engagement, was shot in the forehead, the bullet passing out of the back of his head without killing or even stunning him. He remarked, "Everything seems green all round me." When in the hospital tent he still saw everything green, but otherwise made no complaint. This case appears to favour the cerebral theory of colour vision of Dr. Edridge-Green, the shock to the brain having altered the discriminatory apparatus so that impulses caused by green rays had a preponderating influence.

THE opening meeting of the one hundred and sixty-first session of the Royal Society of Arts will be held on Wednesday evening, November 18, when an address will be delivered by Sir Thomas H. Holdich, vice-president and chairman of the council. The following are among the arrangements for meetings before Christmas:—November 25, Sir William A. Tilden,