equivalent to about one-eighth of the present home production of ammonium sulphate, the necessary water-power being obtained in Scotland, or from a large steam-power station.

2. That the synthetic ammonia (Haber) process should be established forthwith on a commercial unit scale and extended as rapidly as possible, as a post-war measure up to a minimum manufacturing scale of 10,000 tons of ammonia (equivalent to 40,000 tons of ammonium sulphate) per annum; and it suggests that the factory at Billingham-on-Tees, which the Government, in 1918, decided to erect, mainly for the manufacture of ammonium nitrate, might be utilised for the purpose.

3. That an ammonia oxidation plant should be established in conjunction with the synthetic ammonia factory on a scale sufficient to produce 10,000 tons of 95 per cent. nitric acid, or its equivalent in nitrates, and that the plant should be designed to utilise either synthetic or by-product ammonia.

4. That steps should be taken with the view of conserving and increasing the output of combined nitrogen from existing by-product ammonia industries, of securing the better utilisation of the national resources in coal, and of reducing the consumption of *raw* coal as fuel. (The various steps which it is suggested should be taken to secure these ends are set forth.)

5. The Committee further recommends that certain nitrogen fixation processes—*e.g.* the Häusser process, certain cyanide processes, and sulphate recovery processes—should be systematically investigated on a small works scale. It understands that the question of low-temperature carbonisation of coal is being investigated by the Fuel Research Board. It suggests that the researches on the nitrogen problem initiated during the war should be continued under the auspices of the Government for the general benefit of the country; and that the results of the researches carried on up to the present should be edited, and published at the earliest possible moment, subject to such reservations as may be considered necessary by the Government, members of the Research Staff of the Munitions Inventions Department being allowed to communicate to scientific societies the details of their work, subject to such reservations as may be considered necessary by the Government.

The Committee concludes its report with a recommendation that a co-ordinated policy should be framed by an Imperial authority for safeguarding the future nitrogen requirements of the Empire. It points out that, so far as the United Kingdom is concerned, nitrogen fixation and allied industries will constitute a new "key" industry. The Committee is of opinion that the initiation and development of the industry will require the active support of the Government.

It is not to be anticipated, in the present state of the political position, and in view of the large arrears in its programme of reconstruction with which the Government is faced, that any immediate consideration will be given by it to the Committee's recommendations, or that any practical steps will be taken to give effect to them beyond attempting to dispose of the Billingham-on-Tees property, and possibly permitting the Research Section of the Munitions Inventions Department to continue its investigations. We understand that negotiations on behalf of an important group of firms are in progress for the purchase of the Billingham works. But whether the Haber process or the American modification of it will be carried on there remains to be seen. Within the last few days it has been announced that an influential financial syndicate is about to establish a factory in the neighbourhood of Maryport, West Cumberland, to work the Georges Claude process, which is already in operation at Montereau, near Fontainebleau, by which it is claimed that the production of ammonia is increased fourfold as compared with the Haber process, as worked by the Badische Anilin & Soda-Fabrik at Oppau, near Ludwigshafen. The first unit of the synthetic plant will be of sufficient size to produce the equivalent of 50,000 tons of sulphate of ammonia per annum. If this consummation is reached it will go far to solve the problem which the Nitrogen Products Committee has been considering with such thoroughness and care during the last three or four years.

EXPLORATION IN TIBET AND NEIGHBOURING REGIONS.[1]

COL. LENOX CONYNGHAM has done right good service to the science of geography by compiling in one comprehensive volume the complete story of the early exploration of the great Tibetan uplands before that land of mystery and romance became attractive to European geographers, who evolved the map of Tibet as we now know it on a more scientific basis. It would indeed have been useful if the brief preface to the volume had included a somewhat more detailed explanation of the means and the methods employed by these early native surveyors in those amazing journeys which gave us the first (and sometimes the last) outlines of Tibetan geography, and laid the foundations for subsequent map superstructure. The narratives of the individual explorers are given in chronological order, commencing with the journey of Pandit Nain Singh, in 1865, from Nepal to Lhasa, and terminating with that of Atma Ram, who accompanied our first adventurer, Capt. (now Sir Hamilton) Bower, when he traversed Tibet from Kashmir to China in 1891–2, following a route which was not very far removed from that of Nain Singh in earlier days. Then for the first time were the eyes, not only of geographers, but also of archæologists, opened to the immense wealth of scientific and historical knowledge which was to be gathered in that remote part of Asia.

[1] "Records of the Survey of India." Vol. viii. (in two parts). Part i., "Exploration in Tibet and Neighbouring Regions," 1865–79." Pp. xi+213+charts. Part ii., "1879–92." Pp. xi+215–411+charts. (Dehra Dun: Office of the Trigonometrical Survey, 1915.) Price 4 rupees or 5*s.* 4*d.* each part.

For some twelve years the native explorers of the Indian Survey had the field to themselves, and it may safely be said that no Asiatic geographers of the past, not even the Arab adventurers of the Middle Ages, or the Chinese pilgrims of yet earlier times in search of such evidences of their Buddhist faith as were to be found on the frontiers and plains of India, ever established such a remarkable record of geographical accomplishment as did these Lamas and Pandits of Indian Survey history in so short a time. Their success was due primarily to the fact that they were well selected for the special line of exploration which they were expected to follow. Then they were thoroughly well trained in the first elements of geographical reconnaissance by Indian Survey officers.

As a rule their methods were simple, for they included no more than the first principles of traversing on bearings taken by the prismatic compass, distances being measured by pacing, and occasional most valuable checks being derived from latitude observations with the sextant. This involved the use of small instruments which were concealed either in their clothes or in false bottoms to their boxes. A rosary was the convenient means of checking their paces. Considering that many thousands of miles were covered in this way, and that the final reduction of their voluminous records (concealed usually in the lining of their coats) was most satisfactory, no higher and better evidence of the patience and determination of such men as Nain Singh, Kishen Singh (the A–K of the Survey records), or of Ugyen Gyatso could be desired. They were frequently engaged for years on the same quest; they were occasionally caught and enslaved, but almost always managed to save their instruments and their records; and their journeyings carried them across the great plateau to Mongolia and China, and into regions where hitherto no European has followed them.

With the influx of European explorers, started by the remarkable discoveries of Bower, the later stories of Tibetan exploration became public property, but it should be noted that many of the most successful of these later white adventurers have employed native explorers to do the spade work of their geographical mapping, and that with the close of the period indicated in this useful volume (which has conveniently brought together information hitherto scattered and rather difficult to retrieve) the work of the native geographer has by no means come to an end. Another and an even greater volume might follow which should show how much our well-known Tibetan travellers owe to the indefatigable perseverance and the remarkable skill as topographers of their native assistants.

Col. Lenox Conyngham's compilation merely brings together the narratives of the earliest native adventurers, and no book of travel that ever was written contains such a wealth of thrilling personal incident as underlies the simple (and sometimes prosaic) account of these humble Indian workmen. T. H. H.

NOTES.

A SPECIAL meeting of the Royal Society was held on Thursday, January 22, when the Prince of Wales was admitted a fellow, following election by ballot, which took place on May 22, 1919. This election was in pursuance of a clause in the society's statutes which permits any one of his Majesty's subjects who is a Prince of the Blood Royal to be proposed at one of the ordinary meetings by any fellow, provided such proposal shall have been made at a preceding meeting. Under this provision King George V. was elected in 1893 when Duke of York. His Royal Highness was received in the society's vestibule by Sir Joseph Thomson and the officers and vice-presidents, whence, preceded by the mace-bearer, a procession was formed through the ranks of the fellows to the meeting-room. The Prince occupied a seat on the front bench among the fellows. The senior secretary having announced the attendance, his Royal Highness advanced to the president's table and subscribed his name in the charter book, thereupon taking a seat on the left of the president. An attractive discourse was then given by Prof. W. H. Bragg on methods of detecting submarines by sound. Upon its conclusion the Prince thanked the society for his admission, and assured the fellows of his interest in the advancement of scientific research.

DISTURBANCES of wireless messages are commonly known to all operators, and are usually regarded as atmospheric effects. Mr. Marconi, however, in a statement published in the *Daily Mail* of January 27, describes interruptions which occur simultaneously in London and New York, and in which certain long and short signals are repeated more frequently than others, as, for example, the three dots signifying the letter S in the Morse code. In the absence of a physical explanation of these regular and simultaneous interruptions, it is perhaps human, and certainly sensational, to suggest that the signals represent attempts of intelligent beings on another planet, or the moon, to communicate with the earth. The *Daily Mail*, therefore, refers to "recent investigations by Prof. Lowell with his giant telescope" of Martian canals (Prof. Lowell died in 1916), and to Prof. W. H. Pickering, who "has caused extraordinary interest in the United States by recently announcing that he sees signs of life on the moon," though these views have been before the astronomical world for many years, and the phenomena observed admit of other interpretations. The interruptions described by Mr. Marconi are no more wonderful than the magnetic disturbances long registered in magnetic observatories. Such disturbances of the photographic records are often very definite in character, and occur at about the same hour on successive days, while they are also found to occur simultaneously at stations so far apart as Christchurch (N.Z.) and Kew. The magnetic and wireless effects are closely related, but whether they originate in the sun or arise from a common cause operating throughout the solar system has yet to be determined. That they are signals from other worlds is attractive to the imagination, but the hypothesis is more of popular than of scientific interest.