

Research Items.

GYPSY MARRIAGE CUSTOMS IN EASTERN RUMELIA.

—In the course of a correspondence on the language and conditions of the gypsies of Eastern Rumelia which passed between Dr. A. G. Paspatis and Smart and Crofton in 1879, when the first named was in Constantinople, some interesting details were given of gypsy betrothal and marriage customs. In one letter of the series, which is published in Part 3, vol. 5 of the *Journal of the Gypsy Lore Society*, it is stated that the friends, male and female, of the bridegroom go to his intended bride's residence and demand her of her father. If he consents, the bridegroom and his friends go again to the father's house the next day and each receives a present, generally a handkerchief. The bride and bridegroom are then left alone while the party adjourns to an adjacent wine-shop, where they remain until evening. The bride and bridegroom dine together, drinking out of the same wooden bottle as a sign of love. After dinner the bridegroom leaves and the betrothal is considered valid. On the Friday before the wedding, a friend of the bridegroom goes with a wooden bottle to the bride, offering the groom's congratulations, and then with a donkey goes to the forest to cut wood for the ceremony. In the evening of the same day paste is kneaded for a cake to be baked and eaten on the wedding day. On the following day relatives of the groom carry the dowry to the bride. On the Sunday after the wedding the transparent red veil worn by the bride is taken off her face by the bridegroom's man by means of two slender vine sticks and laid on a rose-bush. He then carries two buckets of water on his shoulders taken from any fountain, and these the bride oversets thrice. The fourth time she follows him to the house of the bridegroom, kissing the hands of all passers-by.

A CRYSTAL MASK FROM TIBET.—Mr. H. C. Beasley has published in *Man* for January an illustration of a remarkable crystal mask from Tibet. The mask is that of the goddess Palden Lhamo, one of the Eight Terribles, as is shown by a third eye in the middle of the forehead. The body of her face is worked up from a lump of rock crystal, the features are applied in gilt bronze, and the teeth are probably human, while the eyes are of ivory. It is said that the mask was used to attract evil demons, who were then dealt with by the officiating lama. Palden Lhamo corresponds to Kali of Indian mythology, and in Japan appears as a goblin under the name Mitsume. The Chinese god of disease Yü-yüen, recognisable by his long teeth, also has a third eye, and is probably derived from Palden Lhamo. She was also believed by the Tibetans to have been reincarnated in Queen Victoria. As one of the Eight Terribles, Palden Lhamo rides a chestnut mule, the offspring of a winged mare, and the gift of the goddess of the sea. She carries a string of skulls, and she feeds on corpses given her by the goblins who haunt graveyards, while her scanty garment is a girdle made of the skin of a recently flayed man. She is often shown drinking blood from a cup formed of a human skull.

COCAINE.—Prof. E. Poulsson contributes an article to the *World's Health* for December last (which appears in a new and more attractive cover than formerly) on the properties, use, and abuse of cocaine. The coca plant, coca chewing, and the properties of cocaine as an anæsthetic are described. The effects of cocaine upon the drug addicted are then summarised. These consist of a first stage of well-being or happiness, followed by a condition of restlessness and anxiety in which self-control may be lost. Continual snuffing

of the drug causes nasal catarrh and ulceration of the nasal septum. An extremely characteristic effect is an intense pricking and creeping sensation in the skin, so that the habitué has the impression that it harbours worms or lice, and seeks to get rid of these by digging with his nails or the point of an instrument, so that the body may become covered with sores and ulcers. This form of drug abuse is very widespread, but the author considers that it will be more easy to combat than the use of opium and its products. Coca plantations are of comparatively recent origin and are far from possessing the economic importance of opium plantations. It is possible also to prepare synthetically drugs which possess the paralysing power of cocaine on the sensory nerves but have little or no effect on the brain. The more these are used, the less will become the medical need for cocaine itself.

PROTECTION OF THE GREAT SKUA.—Few birds so restricted a range as the great skua, which in Britain formerly nested only in the Shetland Isles. Its present position is discussed in the *Scottish Naturalist* (1926, p. 169). It is shown that as a result of protection, first because it kept away the sea-eagle, and more recently under the Wild Birds Protection Acts, the great skua has extended its breeding range to several new areas. It is suggested that protection has now gone far enough, and that some restraint might well be placed on the further multiplication in certain areas of this robber and pirate. Its spread in one locality is shown to have been responsible for the complete disappearance there of black-headed gulls, arctic terns, red-throated diver, kittiwakes, and whimbrel, and even the strong herring gulls and lesser black-backed gulls have been reduced to a few pairs on ground which they formerly dominated. Strange to say, the only bird which seems to hold its own in face of the aggression of these great skuas is the common snipe.

THE WARBLE-FLY IN DENMARK.—Denmark is pre-eminently a cattle country, and on this account the damage done by the warble-fly had in 1903 reached the immense sum of £275,000. The matter had become so serious that the legislature took up the question, and in March 1923 passed a first law compelling stock-holders to rid their cattle of warble maggots, or failing such action to submit to the destruction of the pests by representatives of the parish councils at the owners' expense. An account of the legislation and its effects, by Harald Faber, Agricultural Commissioner to the Danish Government, appears in the *Journal of the Ministry of Agriculture* (Jan. 1927, p. 905). The results are striking. Of the 793,250 cattle herds in Denmark, 124,893 were freed from maggots in 1923; in 1924 178,044 herds were examined by authorised inspectors, and in 29.6 per cent. of these maggots were found and exterminated. The policy of the Government has been very satisfactorily reflected in the condition of Danish hides. Before the first law was passed in 1923 (it has been continued by subsequent enactments) the ratio of hides damaged by maggots in 1922 was 20 per cent.; in 1923, after a partial application of the law, damaged hides represented 15 per cent.; in 1924, with the law in full force, the number had fallen to 4.5 per cent., and in 1925 it was 4 per cent. The monetary saving has naturally been very considerable.

SMALL HOLDINGS AND FORESTRY.—Several of the papers read before the subsection of Forestry at the Oxford meeting of the British Association last year

are reprinted in the half-yearly issue (Oct.) of the *Transactions of the Royal Scottish Arboricultural Society*. Perhaps the most important of these is the presidential address by Lord Clinton, entitled "Small Holdings in Relation to State Forest Policy." Much of the ground covered is well known to the scientific forester, especially on the Continent of Europe. It is satisfactory to British foresters to recognise that this aspect of a forest policy is now beginning to become appreciated in Great Britain. It is, in fact, the recognition of the absolute dependence of the forest for the bulk of its labour on some system of small agricultural holdings which afford a certain amount of occupation to the agriculturist at certain seasons of the year, full-time employment being obtainable at other seasons in the forest. Under the scheme adopted by the Forestry Commission, holdings are limited to 10 acres, and 150 days' work in the forest is guaranteed, but more may be granted. The advantages on both sides are obvious. The small-holder, cultivating a small area of land and with a small herd of stock for which grazing at specified times may be available, finds his main occupation in the forest. The State, outside the comparatively small full-time staff it is possible to employ in the management of forest areas, has at hand a labour supply which becomes increasingly skilled in forest work. Finally, the country acquires a settled, contented, and hardy community settled on the land. Small holdings, from the purely agricultural development point of view, are still a doubtful policy to follow. From the forestry viewpoint their successful inauguration in Britain is essential to the future progress of the afforestation work.

RUSSIAN WORK ON MICROBIOLOGY.—The Bureau of Agricultural Microbiology of the State Institute of Experimental Agronomy at Leningrad, which is under the directorship of Prof. S. P. Kostychev, has commenced the publication of a *Bulletin*. The first volume has recently appeared, and it contains an interesting series of papers on biodynamics of soils, comprising results of extensive studies of the bacterial population of various soils and its chemical activities. Other papers include a study of the chemical conditions of fixation of atmospheric oxygen by *Azotobacter agill* (Kostychev a.o.); results of a detailed research in the symbiosis of various bacilli of milk (Ulrich), and two papers on the bacteriological method of control of rodents. Unfortunately, none of the papers is provided with a summary in a western European language, and this will restrict their usefulness to scientific workers of other countries.

LOCAL COAST SUBMERGENCE.—An example of local and relatively rapid submergence of the coast of Galveston Bay is described by Prof. D. W. Johnson and Mr. W. E. Pratt in the *Geographical Journal* for January. In 1917 an oil-field was started near the mouth of Goose Creek, not far from Houston, Texas. Since then, several million barrels of oil have been taken from the field with the result that the Gaillard peninsula, near the centre, and adjacent low coastal areas, have become submerged. In an area two miles and a half long by one mile and a half wide the maximum subsidence is now more than three feet. The ground involved consists of recent sands and clays only slightly more compacted than sea-bottom muds, and the oil is extracted mainly from depths between 1000 ft. and 4000 ft. Prof. Johnson is convinced that the subsidence is purely local and has nothing to do with any general sinking of the gulf coasts. Moreover, its area corresponds with the area of extraction, it is bordered by earth fractures, and it sinks steadily as extraction continues. Prof.

Johnson cites this case as a rare, if not unique, example of subsidence of the earth's coast following the exploitation of an oil-field.

EXPLORATION OF THE RUSSIAN NORTH.—The Institute for the Scientific Exploration of the North at Leningrad (*Sjezdovskaja ul.*, No. 1-3) is publishing a series of its transactions in separate parts, each part containing either one complete paper, or several papers dealing with the same subject. So far, in the interval 1920-1927, thirty-four parts have appeared, dealing with widely varying aspects of the country under exploration. More numerous than any others are the reports on geography, geology, and mineral resources, which include accounts by A. E. Fersman on the tundras of Kola Island (Part 29), and on the Chibina Range of the same island (Part 16); by A. A. Grigoriev on the geology and geological history of the Bolshezemelsk tundra (Part 22); by A. A. Tchernoff, D. I. Stcherbanoff, D. Beliankin, and others, on the mineral deposits of various regions of northern Russia (Parts 10, 18, 20, 24, 35); by V. A. Lindholm on the post-Pliocene mollusca from Murman (Part 12), etc. Another valuable set of papers deals with fish and fisheries of north Russian seas as well as of the Petchora River. These papers include keys to the sea-fishes by Prof. N. M. Knipovitch (Parts 27 and 31); an exhaustive study of the White Sea herring by A. J. Rabinerson (Part 25); a description of fishes and fisheries of the Petchora River by Prof. W. K. Soldatoff (Part 17), etc. Part 19 contains studies of hydrology, currents, and fauna of the Barents Sea by Prof. K. M. Derjugin (including descriptions of some new species from various orders). Ornithologists will find an interesting account on the nesting colonies ("loomeries") of *Uria troille* L. in Novaya Zemlya, in Part 26, by G. P. Gorbunoff. Several papers deal with the economic aspects of the country, these comprising papers by N. Volens on the industries, and especially the agriculture, of the Petchora region (Part 21) and of the Murman coast (Part 28), while S. V. Kerzelli deals specially with reindeer breeding (Part 13). One paper, by V. G. Bogoraz, is devoted to the problems of ethnography in northern Russia.

TAR-DISTILLATE SPRAYS.—The Ministry of Agriculture and Fisheries has issued (Dec. 1926) information based on experimental evidence as to the best use of tar-distillate sprays for fruit trees. These new 'proprietary' washes, which are rapidly superseding the caustic sprays, are made by emulsifying a certain part of the tar-distillate. Carbokrimp, Chafers' No. 1 Winter Wash, Ialine Tar Oil Winter Wash and Mortegg, applied in January at 7½-10 per cent. concentration, were found successful in controlling Rosy Apple aphid and Apple Sucker, while 6 per cent. solutions satisfactorily reduced both aphid and 'brown rot' on plums. Apple and plum trees may also be considerably freed from the caterpillars of the winter and tortrix moths, but these washes are ineffective in reducing apple scab and 'red spider'; if, however, this latter pest occurs on gooseberries, it can be successfully checked by the same sprays. In order to ensure success, the instructions issued must be carefully followed, especially as regards the time at which to carry out the operation. Spraying can only be done with safety when the buds are dormant, e.g. up to the end of January for plums, and somewhat later for apples. Further, the washes should not be applied before December, in order to ensure that the various pests have laid their eggs. Fine, but not frosty, weather is the most suitable. If the water of the district is very hard, an addition of 1 lb.-2 lb. powdered size or glue per 40 gallons is advised. An annual treatment

is recommended, as the effect may be more marked in the year following the season of application. Besides the destruction of insect pests, a luxuriance of foliage produced in the succeeding year is noticeable, although any green leaves in actual contact with the spray will be liable to scorch.

THE MERCURY-ARC POWER RECTIFIER.—Great progress has been made recently in improving the mercury-arc power rectifier for converting alternating current into direct current. It is now very widely used. In the December issue of the *Review* published by the Brown Boveri Co. of Baden, in Switzerland, we learn that one of their rectifiers was tested at a direct current pressure of 8000 volts. It produced a pressure of 12,000 volts between the anodes of the device when the transformer was connected for three-phase working. No disturbance occurred when the rectifier was interrupted under a load of 900 kilowatts. This shows that the voltage limit has not yet been attained. The main difficulty that has to be overcome is to disperse by artificial means the heat produced in the rectifier, as it is a stationary piece of apparatus. In the same *Review*, Mr. Seitz writes a valuable paper on the methods employed for cooling rectifier sets. The methods generally employed are direct cooling by water, indirect cooling by water, and cooling by natural or forced draught. When a continuous water supply cannot be guaranteed, a water flow alarm is supplied so that serious trouble can be avoided. When the water is very hard or when it is impure, indirect water cooling is employed, a special pump being used to keep up the circulation. Natural draught is only used when the load is very small or intermittent and when the room temperature does not exceed 15° C., thus permitting a temperature rise of about 35° C. for the rectifier. For medium and large-sized rectifiers, forced draught is used, centrifugal fans being employed to cool pipes containing circulating water. For a direct current of 1000 amperes and a mean temperature rise of 25° C., the power expended in the fan and circulating pump does not exceed one horse-power.

ESTIMATION OF PHOSPHATES IN CALCAREOUS SILOS.—In the Chemical Series of the *Memoirs of the Department of Agriculture, India*, 8, No. 6, S. Das shows that in the case of highly calcareous soils, Dyer's citric acid method for the estimation of available phosphoric acid is unsuitable, and if the calcium carbonate content of the soil ranges from 1 to 7 per cent., is equally unsatisfactory for potash determinations. After experimenting with various salt solutions, a new and trustworthy method for use with such soils is described. A 1 per cent. potassium carbonate solution is employed for the soil extraction, the proportion of soil to solvent being as 1:10, and after shaking for 24 hours at laboratory temperature, the dissolved P_2O_5 in the extract is estimated by the ammonium molybdate method. The underlying principle of the action of 1 per cent. potassium carbonate solution on calcareous soils is twofold; a reaction takes place with any dicalcic or such other phosphates present, with the production of insoluble tricalcium or other phosphates and of soluble potassium phosphate; and, further, any phosphorus in organic combination in humus is also dissolved.

MARINE STEAM TURBINE PROGRESS.—Marine engineering practice sometimes leads, sometimes follows, land practice. In power stations ashore, advances have been made in the matter of higher steam pressures, the highest on record being 1200 lb. per square inch. The use of steam at 300 lb. to 400 lb. per square inch is fairly common, and considerable economy has been obtained by the utiliza-

tion of such pressures. Attempts are now being made to adopt higher pressures in ships, and an account of the latest advance is contained in a paper on "Progress in Economy of Turbine Machinery on Land and Sea," by Sir Charles Parsons, Mr. R. J. Walker, and Mr. Stanley Cook, recently read to the North-East Coast Institution of Engineers and Shipbuilders. Accompanying the discussion of the value of higher pressures, superheating, and other features of modern practice, are some historical notes and tables giving important details of the various turbine installations, both ashore and afloat, which have in turn created records, and at the end of the paper there is an account of the notable vessel, *King George V.*, launched on the Clyde last summer. Though Loftus Perkins more than forty years ago crossed the Atlantic in the *Anthracite*, using steam at 350 lb. per square inch pressure, general marine practice hitherto has demanded no more than 200 lb. to 250 lb. per square inch pressure in the boilers. In the *King George V.*, however, a vessel of 3500 horse-power, the Parsons-gear turbines are supplied with steam at 550 lb. per square inch superheated to 750° F., the steam being generated in Yarrow boilers. After the builder's trials the *King George V.* was placed on service on the Clyde and ran for three weeks to the end of the season. Consumption trials were then carried out, when with coal having a gross calorific value of 13,880 B.T.U., the fuel consumed worked out at 1.1 lb. per shaft horse-power per hour, thus easily beating all previous records hitherto obtained at sea.

ELECTRIC TRACTION.—In the *Journal of the Institution of Electrical Engineers* for January, F. Lydall gives a review of the progress of electric traction throughout the world which puts the progress made in Great Britain in a much more favourable light than has been generally accepted. Broadly speaking, we can divide railway electrification schemes into suburban and main line schemes. In Great Britain electrification is almost wholly confined to suburban schemes. The Southern Railway utilises it largely. It recently extended the electrification of the south-western section by the addition of about 70 miles to the length of track equipped, and the conversion of about 250 miles of suburban lines on the south-eastern section. The 127 miles of track on the Brighton section already equipped with overhead wires are being gradually converted to the third rail system. Considerable additions are also being made to the electrified portion of the line. The Southern Railway will soon have 854 miles of track electrified on the same third rail system. In France suburban electrification is much less prominent, the principal schemes being the main line electrifications on the Paris-Orléans and the Midi railways. In Switzerland electrification of the main lines has been carried out on a large scale. In Italy electrification has been in progress for the past twenty-five years, and the mileage of track equipped exceeds 600. In Germany the electrification of railways, especially in Silesia and Bavaria, is proceeding very rapidly. By the end of the year the electrified track will be about 700 miles. In Austria the progress has not been so rapid, owing to financial stringency. It is, however, in the United States that much the greatest progress has been made. As electric operation can provide facilities greatly superior to those obtainable from steam operation in respect of schedule speed, and volume of traffic, it is natural that all the great cities in the eastern states have extensive urban and suburban services. In no less than fifteen cities of the United States steps have been taken towards the elimination of smoke from locomotives by electrification or other means.