

Research Items.

REMISSION OF SINS AT THE SHRINE OF A MOSLEM SAINT.—A description of a fair at Pakpattan at the tombs of Bâbâ Farid Shakarganj, which is quoted in the *Indian Antiquary* for August, contains several points of interest to the students of religious belief. The great attraction of this annual fair is the opening of the Gate of Heaven. On the death of the Bâbâ, who is credited in story with wonderful powers during his lifetime, it was published far and wide that whoever passed through his tomb between sunset and sunrise on the new moon in August would be forgiven the sins of the past year, and the fair was established for the benefit of the faithful attending at the tomb for this purpose. The fair is attended by worshippers drawn from districts so wide apart as the North-West Frontier and the United Provinces. On the final night when the gate is to be opened, all pilgrims collect outside the gates of the town, which are closed. On the signal by rocket that the sun is set, they are admitted to the town and all night long pass in single file through the tomb. At sunrise the door is shut. On one occasion the police used light switches to strike the people in order to hasten the movements of the crowd. The people, instead of avoiding the blows, courted them, and on inquiry as to the reason, it was stated that the switches represented the sword blades forming the legendary bridge between earth and heaven on which the feet of the faithful are cut, whereas the wicked fall between the gaps in the bridge into hell below. Those, therefore, who were hit by the police switches considered that they had had their feet cut by the swords of the bridge and were doubly sure of the forgiveness of their sins.

INTELLIGENCE AND FAMILY HISTORY.—Some interesting data bearing upon the question of how far superior intelligence is a family characteristic have been collected by Miss Grace Allen as the result of an investigation of 48 families to which belonged a number of children selected as the result of psychological tests by members of the Teachers' College, New York. The results have been published in *Bull.* 25 of the Eugenics Record Office of the Carnegie Institution of Washington. All the children were of exceptionally high character intellectually, and the study involved the more remote history of the family, present conditions, occupational and home ratings, physical and temperamental traits and birth conditions. Of these families 70 per cent. were Jews, and of these 20 per cent. of German extraction, and 10 per cent. more German on one side of the family. Only one child came of American stock on both sides, and in only three families were all four grandparents American born. As regards occupation, 70 per cent. of the fathers were professional men, and 25 per cent. did clerical or semi-intellectual work; 25 per cent. are college graduates, a frequency twelve times higher than in the population at large. Brothers and sisters and cousins tested for intelligence scored high. The fecundity was low, being about 0.8 of a reproducing child to each parent. First births occur twice as commonly as in the general population; but this is due to the fact that the intelligent groups have an exceptionally high population of first-born children only. The fathers are above the average age because this class marries late. Physically the families belong to a fine stock, being long lived and robustly built. The children show few physical defects. In a preface, Dr. Charles B. Davenport sums up the results of the investigation as showing that the

highest intelligence comes out of a stock that is highly developed on both sides.

GLASS-MAKING IN ANCIENT EGYPT.—The technique of the manufacture of glass vases in ancient Egypt is obscure. Sir Flinders Petrie has suggested in connexion with the examples discovered by himself at Tel-el-Amarna, the use of a rod and a core of sand dipped into melted glass, while Mr. Harry Powell in the "Encyclopædia Britannica" suggested alternatively that they were blown. Mr. James H. Gardiner in *Glass* for July considers that the true method of production must differ from anything that has yet been suggested, basing his view on the examination of a number of examples of the XVIIIth Dynasty. The softening or plastic temperature is about 900° C., not a great deal below that of good English flint glass. Some, however, have been drawn from material which would have needed quite 1000° C. to form. In the case of a fish-shaped vase from Tel-el-Amarna, the body is a well-melted blue soda metal with fine seeds. The tail portion is solid and has been made and ornamented first and then squeezed on to the soft body. The indentation of the flat-nosed tongs used for holding can be distinctly felt. The coloured-glass pattern was made by threading coloured glass on to the surface. Notwithstanding the weighty negative evidence of an absence of any indications of blowing tools or fragments showing clear inside surfaces, the author is strongly of the opinion that the glass objects of the XVIIIth Dynasty show the beginnings of fabrication of glass vessels by blowing, which afterwards developed into the blown ware of the Greek and Roman period. It is suggested that the fact that in all cases there was a circular opening in the neck showing abrasion, as if a metal rod had been introduced and withdrawn, may have been due to the use of a metal funnel to introduce hot sand while the material was soft, and that the object was then buried in hot ashes to cool slowly.

THE GREAT RIFT VALLEY.—In a paper in the *Geographical Journal* for August, on the Nyasaland section of the great Rift Valley, Dr. F. Dixey advances the view that in early Cretaceous or possibly late Jurassic times, the initial uplift in the Nyasa region took the form of a gentle anticlinorium, or large anticline, and that the more or less meridional troughs so produced were occupied eventually by rivers. At a later date rift faulting began, and continued intermittently through a large part of Tertiary and Quaternary times. Intersecting faults also extended into the regions bordering the main rift on both sides. The volcanic history of the area seems to have been largely confined to late Tertiary or early Quaternary times. Dr. Dixey finds no evidence to support the hypothesis of a marine sedimentary phase of Oligocene age. Lastly, he gives reasons in favour of the rift-faulting of the region being due to long-continued tensional stresses rather than to compression. These are the absence of thrusts and folds and the development of much block faulting; the occurrence of subsidiary rifts parallel with the main rift; the existence of a reticulated system of rift valleys; low-step faults extending into the middle of the rift valley floor; and the successive tilting of the floor of the northern end of the rift in one direction.

TERTIARY FOSSILS FROM JAPAN.—No less than six papers on the tertiary mollusca of Japan, from the

pen of Prof. Matajira Yokoyama, appear in the first volume of the *Journal of the Faculty of Science of the Imperial University of Tokyo*. Most of these fossils come from the central districts of the main island of Japan, but some are from the oil-fields in the north-western part of the "Main Island of Hokkaido" (formerly known as Yedo). Prof. Yokoyama's communications total 87 pages illustrated by 19 plates, which are very good, but not quite equal to the efforts of the Japanese artist at his best. The text, beyond brief statements as to the position and age of the respective beds in which they occur, is confined to systematic descriptions of the species, many of which are described as new.

BAXTER BASIN GAS-FIELD, WYOMING.—Mr. Julian D. Sears contributes an interesting account of the geology of the Baxter Basin Gas-field, Sweetwater County, Wyoming, in *Bulletin* 781-B of the United States Geological Survey. This field was first proved in 1922 by the completion of two wells of large yield; previously, drilling on the Rock Springs anticline, of which the Baxter Basin occupies structurally the highest part, had resulted in little or no success; even now there seems to be small prospect of oil being found in commercial quantity. Gas is found in commercial quantity, however, in each of the three domes developed along the crest of the main structure, and is produced from the Upper Cretaceous Frontier and Dakota sandstones. Each dome has its own gas-pool, there being no single continuous pool common to all three as they are separated by structural depressions and by faults that offset the reservoir beds. Twenty-three wells had been drilled in this field up to the time of survey; these ranged from 1000 to 3400 feet deep, finding the Frontier sands at depths from 1800 ft. to 2000 ft., and the Dakota sands at depths from 2500 ft. to 3400 ft., according to the positions of the wells concerned. Some remarkable yields are recorded: one well gave 2,000,000 cubic feet per day from the Frontier and 70,000,000 cubic feet from the Dakota; another well found water in the Frontier but yielded 21,000,000 cubic feet of gas per day from the Dakota; other yields from the Dakota (unquestionably the richest sand in the field) are from 17,000,000 cubic feet to 35,000,000 cubic feet daily. Water occurs high on the flanks of two of the productive domes, thus leaving very little room for an intervening oil layer between it and the gas; this is one of the reasons dispelling any hope of commercial oil production from this field.

CYCLONES OVER CEYLON.—Cyclonic movements in Ceylon are dealt with by Mr. A. J. Bamford, the superintendent of the Colombo Observatory, in the *Ceylon Journal of Science*, vol. I, part I, in continuation of the series that have appeared in the past in the bulletins of the Colombo Observatory. Any discussion of the movements of cyclones wherever dealt with is of general interest, as cyclones are so decidedly the centres of action with respect to the weather both over land and sea. In the discussion several storms are analysed, and much information can be gleaned as to the main seat of control in that part of the globe. Other special features are dealt with in detail, especially the heavy rains over Ceylon of September 29-30, 1924, falls up to 12 inches being reported which occasioned floods in many places. The weather over the island at the time was of the usual south-west monsoon type; the fall of temperature on September 29 is said to be the result and not the cause of the rains. Maps are given showing the rainfall over Ceylon.

CLIMATOLOGY OF FALMOUTH.—Weather observations at Falmouth for the year 1925 and the mean values for 55 years, 1871-1925, have just been issued by Mr. J. B. Phillips, the superintendent of Falmouth Observatory. The observations are of considerable value, as they show great equability of the climate throughout the year. The mid-winter month January had the day maximum temperature between 50° F. and 54° F. on 24 days, and there was only one day with the temperature below 45°; the minimum or night temperature was only below 40° on six days and on three days was above 50°. The mean temperature for January was 3°·4 above the average. In November and December, when periods of exceptionally cold weather were experienced over Great Britain, the relation of Falmouth to other parts of the country is interesting. The mean temperature for the year was 51°·5, which is 0°·7 above the normal; the warmest months with relation to the average for 55 years were January and October, both of which exceeded the average by 3°·4. The total hours of bright sunshine in the year were 1819, which was 69 hours above the mean, and it was the highest for the year since 1911, when the sun shone for 2056 hours. During the first six months of 1925, Falmouth had 43 per cent. of the possible duration of sunshine, while that for the British Isles was 35 per cent. For June, Falmouth had 77 per cent. of the possible duration of sunshine, while for the British Isles it was 50 per cent. The daily average sunshine at Falmouth for the several seasons was: spring 5·41 hours a day, summer 7·88 hours a day, autumn 4·33 hours a day, winter 2·36 hours a day. The total rainfall for the year was 49·77 in., which is 4·01 in. more than the mean. The outstanding feature of the year was the rainless period from May 29 to July 3, absolutely no rain falling in June, while the mean for 55 years is 2·24 in.

THE CRYSTAL STRUCTURE OF MAGNESIUM PLUMBIDE.—With the publication of J. B. Friauf's results on the crystal structure of magnesium plumbide (Mg_2Pb), in the *Journal of the American Chemical Society* for July 1926, the crystal structures of the three intermetallic compounds which magnesium is known to form with silicon, tin, and lead, are now completely determined. The plumbide, prepared by melting the calculated amounts of magnesium and lead under a protective layer of sodium and potassium chlorides, was ground to powder under kerosene, and a sample, covered with a little paraffin, rotated during exposure to radiation from a molybdenum target. The powder diffraction pattern was photographed, and the unit cell found to contain four molecules. The position of the atoms corresponded with the calcium fluoride arrangement.

SPIRIT THERMOMETERS.—The August issue of the *Journal of Scientific Instruments* contains an article by Mr. W. F. Higgins, of the National Physical Laboratory, of considerable importance to the makers and users of spirit thermometers. It has been noticed that the readings of certain spirit thermometers when placed in melting ice have decreased with age at rates of the order of 1° F. per month. Experiment has shown that the decrease is not due to loss of spirit, through minute cracks in the glass or to change of volume of the glass, but to the presence of small quantities of acetone in the methyl or ethyl alcohol used in the instrument. Ten per cent. of this impurity is sufficient to cause a lowering of the ice point at the rate of 1° F. every ten days for the first few months after the thermometer is made. The effect appears to be due to the polymerisation of the acetone under the influence of light.