

Research Items

Religious Beliefs of Serbian Gypsies

DR. ALEXANDER PETROVIĆ, in continuation of his studies of the Serbian gypsies (*J. Gypsy Lore Soc.*, Ser. 3, 16, 1-2) deals with religion and superstitions. The Serbian gypsies, who speak the Romani language, can be divided into two groups of a higher and lower culture. The first are permanent city-dwellers, while the latter have no permanent place of habitation. The former have adopted the religions and customs of other people, but with a difference. The beliefs of the second class appear to preserve some of the elements of the ancient gypsy religion. *Del* is God, the sky or heaven, or the clouds. *Del* is the unlimited space above the earth, and sends rain, snow, hail. Once *Del* was close to the earth. This was when life was good to live, and everything came easily. But *Del* was offended and moved away. *Dji* is the stomach or abdomen, and also the soul. If asked where the soul is situated, a gypsy will point to his navel; but if a physical condition of the stomach has to be described, they use *por*. *Dji* is also the heart. In Bela Crkva gypsy musicians use one word *odji* for both heart and soul. *Dji* is the centre of everything, the most precious part of anything, and also the breath of one's being. When a man dies "the soul (*dji*) escapes hence by the mouth". Coano "vampire", "ghost", is the word used also for the soul that goes out of the mouth when a man dies. As soon as a body was placed in the grave, the mourners used to throw earth on it and run away, and no one looked back, because the ghost would think he was being called and follow. The spirit of evil is *Beng*, who appears incarnate immediately his name is mentioned. The gypsies do not know if Good exists in the world, but they are sure that Evil does. *Kar*, "man", "male", and the male organ of generation brings luck. It is the creative and active principle. *Kar* is used in oaths instead of "God". In looking at their religion as a whole it must be emphasized that they are realists, and believe in what can be seen, for example, the identification of God and sky. *Del* gives but does not create. The creative principle is *kar*.

Kutchin Potlatch

DR. CORNELIUS OSGOOD has attempted, as part of a study which will cover eventually the northern Athapascan area as a whole, a reconstruction of the culture, as it was about one hundred years ago, of the Kutchin, or rather of the several tribes known by that name, who inhabit the country from the region around the great bend of the Yukon River, eastwards into the valley of the Mackenzie, north to the littoral of the Arctic Ocean held by the Eskimo, and south to roughly lat. 65° north (*Yale Publications in Ethnology*, No. 14). His observations include an account of the potlatch, of which the performance was most fully celebrated among the Crow River Kutchin. It was given in honour of a person deceased, but at no other time or occasion. The donor, a relative, accumulated food and property for the purpose during the period of mourning. A period of one to two years might elapse, and the size of the potlatch

would depend upon the wealth and influence of the persons involved, as well as on whether it was a time of plenty or scarcity. The primary purpose seems to have been the enhancement of family or personal prestige, as well as, in the background, the idea of reciprocity. The potlatch was generally held in a special ceremonial ground or enclosure. The fence served the purpose of apportioning the gifts, skins and so on, which were set out there on display. The duration of the potlatch correlated directly with the elaborateness of the display and the time required to consume all the food prepared. In a small potlatch, only the local population participated. In the larger, other tribes were invited to attend. Important or distant guests were formally escorted to a suitable reception, watch for their approach being kept night and day for some time. On arrival, the leader of each group made a suitable speech, and a welcoming reply was made. Dancing was a common activity during the ceremony. Speeches were made at intervals, and games and tricks played. The final act was the distribution of gifts, performed by a friend of the giver who was paid for his service.

Impaction of Man's Third Molar Teeth

MR. BOWDLER HENRY and Dr. G. M. Morant give an account of a preliminary examination they have made of skiagrams showing man's wisdom teeth in the process of eruption (*Biometrika*, 378, Dec. 1936). As is well known, eruption of a tooth involves an elaborate series of growth movements not only in the tissues which surround a cutting tooth, but also in parts of the bony tissues at a distance. The growth movements which bring up the third molars—man's wisdom teeth—are particularly complicated, and are very apt to be delayed or arrested, particularly in western Europeans. The teeth most liable to arrest are the lower molars. The impaction of these may give rise to disorders so serious as to threaten the life of a sufferer. It would be a great advantage if a dental surgeon could tell, from the examination of dental skiagrams of young people, whether or not their wisdom teeth were likely to become impacted. Mr. Bowdler Henry has proposed certain methods, based on the examination of 622 skiagrams. His results have been examined statistically by Dr. G. M. Morant. They have determined to extend the investigation, but meantime certain hints are given which are likely to have a practical value for dental surgeons.

Sponges of the Panama Canal

DR. M. W. DE LAUBENFELS has recently compared collections of shallow-water, and mainly intertidal sponges, made by him at either end of the Panama Canal, during the summer of 1933 (*Proc. U.S. Nat. Mus.*, 83, No. 2993; 1936). Among a total of 31 species collected, 10 are restricted to the Pacific side, 15 to the Atlantic side, 6 being recorded from both sides. New species are described in the respective proportions of 4 to 16 on the Pacific side, and 6 to 21 on the Atlantic side; not as 5 and 7 respectively, as stated, apparently in error. With the exception of

four strictly keratose species, including two *Hirciniæ*, from the Atlantic side, and one, *Aplysilla*, from the Pacific, all are siliceous species, the *Calcarea* not being represented.

The Teak Borer of Burma

THROUGHOUT the main teak-bearing areas of Burma, the timber suffers from the beehole or gallery caused by the larva of a large moth, *Xyleutes ceramicæ*. This insect is a member of the primitive family Cossidæ to which the familiar goat moth (*Cossus cossus*) of Britain and other European countries belongs. A survey of the injuries caused by the beehole borer has recently been made by Mr. D. J. Atkinson, forest entomologist for Burma. His account forms No. 1 of vol. 2 of *Indian Forest Records* (N.S.), Entomology (1936) wherein data are given for the mean incidence of the borer as affecting 1,001 trees taken from 56 localities. Average rainfall is a sound index of the probable severity of the damage: below the isohyet of 55 in., conditions become less favourable to the insect. It was also found that much of the naturally grown teak timber in Burma is more heavily infested than a great deal of the plantation timber. The faster growth of the latter operates to advantage, and serves also to accentuate the natural tendency for an increase in beehole borer damage towards the centre of the tree, and the faster the growth of the tree the greater the volume of comparatively borer-free timber which will be produced. Where conditions are suitable, heavy and repeated thinnings to encourage the volume increment, to outstrip the borer increment, are advised.

Storage of Pollen

THE possibility of storing pollen from one year to another has distinct advantages in horticultural practice. Hitherto, although methods have been devised for transplanting pollen over considerable distances, the maximum viability has not extended beyond the current season. B. R. Nebel and M. L. Ruttle (*J. Pom. and Hort. Sci.*, 14 (4), 347; 1937) have succeeded in keeping pollen of apple and sour cherry in store for more than two years, and their data indicate that similar longevity may be attained by pollen from pear, plum, sweet cherry and grape. The latter species have been stored for more than a year, but the experiments are as yet incomplete. The period of life of apple and sour cherry pollen stored at 2°–8° C. increases with decreasing humidity from 100 per cent to 50 per cent, the latter being the optimum. Apple pollen which had apparently lost its viability after being stored in the laboratory for five weeks was revived by storing at 2°–8° C. and 80 per cent humidity. Pollen from several common varieties of the species mentioned was used, and the success of the experiments should enable plant breeders to make crosses between varieties which flower in different seasons or are separated geographically.

Effect of Oxidizing Agents on Crop Production

PROF. V. SUBRAHMANYAN, C. R. Harihara Iyer and R. Rajagopalan, of the Indian Institute of Science, Bangalore, in a communication to the Editor, have directed attention to the possibilities of increasing crop production through judicious applications of chemical oxidizers, and have outlined the attendant

chemical and biological changes. All crops showed increase in yield on both unmanured and manured soils. The oxidizing agents differed in efficiency, potassium permanganate usually being more active than either hydrogen peroxide or ferric oxide. Permanganate gave the best results when applied as a basal dressing, while manganese dioxide was most efficient as a top dressing. The crops also varied in their response to different oxidizers. Ammonia production in the soil was increased, and the oxidation of organic matter facilitated, but the biological changes consequent on the application of oxidizers were not pronounced. With permanganate there was an initial depression in the number of bacteria followed by a rapid rise after the fourth day. Soluble manganese salts applied to soil pass into an insoluble form and oxidation of organic matter occurs with the production of carbon dioxide, particularly on non-sterile soils. There is some evidence that biological activity is stimulated, resulting in greater production of carbon dioxide and increased plant assimilation. Manganese dioxide and permanganate gave the best results, manganous sulphate following next in order, while manganous carbonate was not much superior to untreated control. Pretreatment with lime was found to depress the yield, at any rate in the case of the eight varieties of tomatoes that were tried. In none of the cases was there any evidence of increased intake of manganese. The foregoing and other observations would suggest that although certain inorganic compounds may produce profound physiological effects in culture solutions, through purely ionic action, they act in a different way in the soil, this being particularly true of manganese salts, which are rendered insoluble in the soil.

The Structure of a Cellulose Wall

THE *Valonia* cell wall, of which a model is figured by Drs. R. D. Preston and W. T. Astbury in a recent paper (*Proc. Roy. Soc.*, B, 122, No. 826, March 3, 1937) must have been submitted to far more intensive study than the cell wall of any other individual cell. As a result, a most interesting and complicated structure is revealed. The cellulose chains in one of these layers form a system of meridians in the wall running from the base to the apex of the cell, and the chains of the alternate layers build a system of spirals closing down on the two 'poles' defined by the meridians. The X-ray photographs confirm the fibrillar structure suggested by the microscope, and it is now clear that the *Valonia* wall is built of alternating layers of differently orientated cellulose fibrils which cross each other at an angle of a little less than 90°. The major extinction position shown by the polarizing microscope bisects this angle approximately, though its position varies with the varying proportion of the two types of lamellæ. It is abundantly clear that the direction of the cellulose chains in a cell wall cannot be reliably determined by observations with a polarizing microscope alone. The authors discuss the involved problems presented by the deposition of such a wall by the growing cell. There seems no doubt that the patchwork appearance indicated in surface view on examination by the polarizing microscope is the result of the cracking of the outer layers by the continued volume expansion of the growing cell, but it is difficult to visualize a mechanism which should lead to the successive deposition of layers with cellulose chains crossing at an angle of nearly 90°.

The Aluminizing of Telescope Mirrors

ON *Leaflet* No. 96 issued by the Astronomical Society of the Pacific, Dr. J. Strong of the California Institute of Technology, contributes a short article on "What Aluminium has done for the Reflecting Telescope". An account both of the history of the coating of mirror surfaces with aluminium and other metals by an evaporation process, and of the promising astronomical results obtained with reflectors that had been aluminized, has already been given in *NATURE* (134, 522; 1934). The chief advantages of using aluminized mirrors in telescopes are: (1) the high degree of reflectivity and freedom from scattered light maintained over a considerable period of time, as compared with the life of a silvered surface; (2) the high reflectivity in the violet end of the spectrum where a silvered surface absorbs strongly. Thus, aluminium reflects 87 per cent of the incident light below wave-length 4100 Å., whereas the reflectivity of a freshly silvered surface rapidly diminishes from 90 per cent at $\lambda 4100$ to only 4 per cent at $\lambda 3150$. Consequently, with an aluminized optical train, it is possible to photograph stellar spectra down to the limit of transmission of the earth's atmosphere at about $\lambda 3000$. This latter property has enabled Wright at the Lick Observatory to discover new emission lines in the spectra of planetary nebulae, while Duncan has found the existence of an outer envelope to the well-known ring nebula in Lyra. Another illustration of the value of aluminized surfaces is the fact that after the mirrors of the 60-inch and 100-inch reflectors on Mount Wilson had been aluminized, it was found that the resulting gain at the Cassegrain focus (involving reflections at three surfaces) was equivalent to one photographic magnitude, or about the increase in light grasp of the 100-inch as compared with that of the 60-inch. Although in the process of aluminizing smaller mirrors difficulties are sometimes encountered, Dr. Strong thinks that no unusual problem will be presented in aluminizing the 200-inch mirror when it is ready; the 36-inch Crossley reflector at the Lick Observatory and the two great telescopes at Mount Wilson have already been successfully treated.

Electricity in Mining

To the *Journal of the Institution of Electrical Engineers* of February, Prof. W. M. Thornton contributes an interesting review of the progress made in the use of electricity in mining during last year. A recent figure for the number of electric units consumed per ton of coal raised is 25. This includes the heavy pumping demands. In Northumberland and Durham alone, it has been estimated that 125 million tons of water are raised annually. This is enough to form a lake of 25 square miles in area and 6 feet deep. Underground haulage, for which an electrical drive is admirably suited, takes nearly as much power as pumping. But there are still 40,000 ponies employed in Great Britain on underground haulage. This may be compared with 64,000 ten years ago. Considerable improvements in the design of ventilating fans for collieries have recently been made, embodying the most recent theories of air screws. A 300-h.p. fan, in use at Dodworth colliery, has an 89 per cent efficiency—a remarkable performance. The flame safety lamp in its early days showed the presence of high proportions of firedamp by the gauze becoming red hot. In capable and trained

hands it proved on the whole a trustworthy guide to the percentage of firedamp in the mine. But it cannot, in unskilled hands, be used to detect the safety limits of $1\frac{1}{4}$ or even $2\frac{1}{2}$ per cent. Two forms of electric safety lamp have recently been fitted with a means of rapidly detecting 1-4 per cent of firedamp. One of these, the Gray 4-volt acid lamp, is coming into use, and is approved by the Mines Department. An interesting development is the electrostatic precipitation by the Lodge method of the finely divided tar fog in coal or coke-oven gas. Two 15,000 volt d.c. generators are mounted on insulators and connected in series. The negative terminal is connected to a wire grid and the positive to plates. On the application of the field, the fog becomes charged negatively, deposits on the positive plates, and falls. In one such plant about 6.5 million cubic feet are treated daily, and practically every trace of fog is removed. The currents used vary between one twentieth and one half an ampere.

Synthesis of Fluorene Compounds

FURTHER contributions to the study of diphenyl and its derivatives have been published by Prof. L. Mascarelli and his co-workers (*Atti Accad. Sci. Torino*, 72, 64 and 109; 1937). Of special interest is the behaviour of 2,4'-dimethyl-2'-aminodiphenyl, the preparation of which is described. When this substance is diazotized and the product boiled with water, an almost theoretical yield of 2-methylfluorene is obtained. This reaction provides a second example of the direct synthesis of a fluorene ring compound from a diphenyl derivative, which was discovered by Mascarelli in 1932. The trisubstituted diphenyl compound 2,6'-dimethyl-2'-aminodiphenyl, when subjected to a similar treatment, gives only a small yield of 4-methylfluorene. With a tetrasubstituted diphenyl derivative, no fluorene ring synthesis occurs. The subject is further discussed in a paper by Prof. Mascarelli (*Gazzetta Chimica Italiana*, 66, 843; 1936).

Colour Variation in the Equatorial Belts of Jupiter

MR. A. STANLEY WILLIAMS, a very assiduous observer of the planet Jupiter, contributes an interesting paper on this subject to *Mon. Not. Roy. Astro. Soc.*, 97, 2 (Dec. 1936) which deals with his observations from 1930 to the end of last year. His first paper on the subject, published in 1899, showed that the observations up to that date indicated a period of 12.08 years in the variation, and his second paper in 1930 gave a period of 12.5 years. The results of the last six years' work show that the period must be shortened to 11.86 years, the period of the revolution of the planet around the sun. The adopted elements of variation are: Standard epoch = 1838.52 + 11.86 E years. At the time of a standard epoch the North Equatorial Belt is at or near a minimum of redness, while the South Equatorial Belt is at or near a maximum. At intermediate epochs the colours of the belts are reversed from those just mentioned. As the computed date of the next standard epoch is 1945.2, when the North Equatorial Belt will be at or near a minimum of redness, and the South Equatorial Belt at or near a maximum, observations during 1945 and a year or two before and after are highly desirable.