



SATURDAY, DECEMBER 31, 1927.

CONTENTS.

	PAGE
Festivals and Survivals . . . . .	941
The Flow of Water . . . . .	943
A Geography of the World. By R. N. R. B. . . . .	945
Agricultural Education and Research. By Prof. Clement Heighan . . . . .	946
Our Bookshelf . . . . .	947
Letters to the Editor :	
The 'Palaeolithic Implements' from Sligo.—Prof. R. A. S. Macalister, Prof. J. Kaye Charlesworth, Dr. R. Lloyd Praeger, and A. W. Stelfox . . . . .	949
Thermodynamics, Wave-theory, and the Compton Effect.—Prof. C. V. Raman, F.R.S. . . . .	950
The Magnetic Properties of Single Crystals of Nickel.—Seisi Kaya and Yoshio Masiyama . . . . .	951
New Methods of Electrically Maintaining Mechanical Oscillations.—Dr. J. H. Vincent . . . . .	952
Standardisation of Telephone Apparatus.—B. S. Cohen; The Writer of the Article . . . . .	953
John W. Draper's Position in Science.—Prof. P. B. McDonald . . . . .	953
A Theory of the Upper Atmosphere and Meteors.—The Right Hon. the Earl of Berkeley, F.R.S. . . . .	954
Further Hominid Remains of Lower Quaternary Age from the Chou Kou Tien Deposit.—Prof. Davidson Black . . . . .	954
The Publications of the Royal Society.—Sir Joseph Larmor, F.R.S. . . . .	954
The Antirachitic Vitamin D . . . . .	955
Atoms and their Packing Fractions. By Dr. F. W. Aston, F.R.S. . . . .	956
Baron de Montyon, F.R.S. (1733-1820), and the Paris Academy of Sciences. By T. E. James . . . . .	960
News and Views . . . . .	961
Our Astronomical Column . . . . .	964
Research Items . . . . .	965
The Hungarian Biological Research Institute. By Dr. F. A. Bather, F.R.S. . . . .	968
The Undercooling of Some Aluminium Alloys. By F. C. T . . . . .	969
University and Educational Intelligence . . . . .	971
Calendar of Customs and Festivals . . . . .	972
Societies and Academies . . . . .	973
Official Publications Received . . . . .	976
Diary of Societies, Conference, and Exhibitions . . . . .	976
Recent Scientific and Technical Books . . . . .	Supp. iii

*Editorial and Publishing Offices :*

MACMILLAN & CO., LTD.,  
ST. MARTIN'S STREET, LONDON, W.C.2.

Editorial communications should be addressed to the Editor.  
Advertisements and business letters to the Publishers.

Telephone Number: GERRARD 8830.

Telegraphic Address: PHUSIS, WESTRAND, LONDON.

No. 3035, VOL. 120]

Festivals and Survivals.

ELSEWHERE in this issue we publish the first of a series of brief notes on the calendar, which will appear from week to week in the coming year. These notes will deal with the principal fasts, feasts, and festivals of the Christian year, referring especially to the traditions, the customs, and the usages which are or have been associated with them. When possible, attention will be directed to similar observances in religions other than the Christian where these present analogies to, or serve to throw light upon, the origin and meaning of religious tradition. It is by the citation of such parallels that much in popular belief and custom, which those who in the past were curious in such matters thought merely quaint or inexplicable, has been shown to be a survival of a primitive mode of thought and a corresponding ritual. In his monumental works on early forms of religion, Sir James Frazer has interpreted the meaning of many of these periodic and seasonal observances, and he has interpreted them in such a way as to throw light on their significance in relation to the lowly as well as more highly organised beliefs. Throughout the "Golden Bough," in examples drawn from the beliefs and practices of Christian and pagan alike, there runs the central theme of the doctrine of atonement, of the sacrifice of a deity incarnate in man or animal, of the victim offered up for the salvation of the community, whether it be a community of worshippers or of subjects, and sometimes of both.

Although the more primitive peoples of to-day as we know them may be by no means so unsophisticated as they are held to be in popular belief, yet in the simpler societies the primal springs of action are more readily to be discerned. In the more complex civilisations of advanced races they are overlaid and obscured by tradition, convention, and sentiment. In all alike, however, from the lowest to the highest, in the ultimate analysis the fundamental urge is directed towards the preservation of the individual and the race. In some cases the two may conflict, as they did in the opposition of the spiritual and the material in the monasticism of the Middle Ages: in extremes both may be ignored. Given these fundamental motives in conjunction with the primitive animistic interpretation of Nature, on one side there arises from the magical ideas connected with the organs of reproduction and their function, an abhorrence of a contravention of sexual regulations in combination with a periodic unrestricted licence of orgiastic rites; on the other, many and various means are brought into operation,

especially at certain seasons of the year, to promote the fertility and prosperity of the stock or crops, and to ensure the preservation and increase of the food supply. The sexual licence of a normally strict society finds its analogy in the sacrificial rite or ceremonial meal which, it has been found, at times and with some peoples, ignores the taboo of the sacred animal. Nor is it enough thus to enhance actively the forces of Nature; the individual and the group must be protected from the influence, more often malign than benignant, of the spirits, whether they be conceived as of the deities or of the dead. Hence the propitiatory rites, the funerary ceremonies, and the various means taken to drive away or ward off spirits and the ghosts of the departed. These dimly survive even to-day. All *Hallow-e'en* is the Feast of the Dead; we still carry the dead man from the house feet first that he may not return.

In a community as that of the British Isles, which for the greater part of its history has been predominantly dependent upon agriculture, it should not be unexpected to find customs which point to a survival of these primitive ideas. Many of the customs of the 'harvest home' are to the ordinary observer now meaningless; but when, for example, as the last load is brought in, the men are drenched with water by the women waiting for them, the rainfall which will bring fertility in the future is ensured. When in some remoter parts a few stalks of corn are still fastened together in something of the semblance of a human figure or 'dolly,' it recalls the time when the precious seed was preserved for the following season by being regarded as a material form of the deity, and invested with all his sanctity. If it were possible to attain a position of complete philosophical detachment, it would not be far-fetched to regard the mystic communion of those who partake of a ritual meal of the first fruits of the grain, which embodies the spirit of the corn, or of the sacrificial victim in the religious rites of some primitive tribe and of those who hold the extreme doctrines of the sacrament as one and the same. To-day in Italy a blend of paganism and Christianity sets up in a field after the harvest has been taken twelve little corn figures around a thirteenth, representing in the traditional form of the corn spirit our Lord and the Twelve Apostles.

The election of a King or Lord of Misrule on Twelfth Night goes back far beyond the *Saturnalia*, with which it is usually compared, to their common origin in the ritual unrestraint of some primitive fertility rite. In even more dramatic form the folk dance 'gathering peascods' ensures magically

a full crop by the simulation of gathering it, and the Durham sword dance perpetuates the slaughter of the king to secure in a younger successor the vigour of the community. The Abbots Bromley horned dance may date from an even remoter time when members of a hunting community wore, not ash branches, but antlers on their heads to represent the deer, thus securing the food supply by a ceremonial representation of their prey. The Witches' Sabbath, obviously a perverted fertility rite, also may go back beyond the agricultural to a pastoral stage with a six- instead of three-monthly division of the year at spring and autumn, as well as enshrine the memory of a ritual cannibalism not entirely due to a morbid popular imagination.

It is not surprising that in the earliest days of the Christian Church a rigid abstention from the rites of paganism was required of believers, an abstention they frequently failed to observe. Civic duties under Roman rule or in a community largely Greek entailed performance of, or participation in, a ceremonial involving religious elements. Further, in an eastern population of mixed races and religions, the desire to take part in a general merry-making is sometimes apt to overshadow differences of belief. The early Christians were forbidden even to join in the custom of an interchange of gifts on the Kalends of January; but how strong was the hold of the old gods is seen in the perpetuation of the Mother Goddess and the Veiled Artemis in the Madonna; the medieval devil still shows the cloven hoof of Pan and the horns of the woodland deities.

When the puritanical aloofness of the early Christians gave way in self-defence to a spirit of compromise, the Christian feasts and fasts were made to agree in time with those of paganism or of the old dispensation. The celebration of the birth of Christ was fixed at about the winter solstice, the time of the great feast of the god Mithra, while the Crucifixion and the Resurrection fell at the celebration of the Passover and the spring festival of other oriental religions. It was the duty of the high priest to fix the date of the Passover from observation of the moon's phases: the Church still fixes the date of Easter in relation to the same phenomenon. The coincidence of these festivals did not escape the notice of the ancients themselves, and the followers of Mithra accused the Christians of having copied their rites, while a like accusation was brought against them by the Christians. It must also be remembered that, owing to their racial inheritance and their social environment, the early Christians did not differ essentially in mentality from their fellows. However far apart they stood from them

in form of observance and theological doctrine, their fundamental religious ideations had not yet diverged much from those of their contemporaries.

Traces of this relationship can be seen in the theological discussions within the Church to quite a late date. Purely magical ideas abound in the writings of the Fathers and the lives of the Saints. Much of medieval and still later belief—witness the doctrine of witchcraft—is essentially primitive. Mathew Hopkins, the Essex witch finder, who swam a witch or weighed her against the Parish Bible, differs in method but not in kind from the South African witch doctor who ‘smells out’ a witch by ‘throwing the bones.’ Witchcraft was not merely a popular superstition. Even in the seventeenth century, belief in the witch to many was a test of orthodoxy, while the doctrines of the Council of Trent contain elements which are of the purest animism, at least in form, however theological interpretation may now attempt to explain them away.

The reason for the persistence of a primitive mode of thought which we now look upon as alien to the true spirit of Christianity is not far to seek. In the spread of Christianity, however strong the denunciation of paganism, a certain toleration and adaptation was the practice. This was inevitable, especially in the later days of missionary effort, when a prince and all his people might be baptised *en masse* on one day. It was impossible that every individual, or even that any considerable number, had already been personally convinced of his or her theological error and instructed in Christian doctrine. Consequently, in the remoter parts, such as Britain, Scandinavia, Central Europe, a mass of pagan beliefs and observances survived under the ægis of Christianity. Slowly and very gradually, as in succeeding ages an increasing number of individuals of stronger intellectual calibre have emancipated themselves from the trammels of tradition, ritual, and belief has been purged. But in remoter districts, in the Balkans, in Russia, among all the peasant populations of Europe, they linger to-day. In the British Isles most of them have vanished, but here and there traces of a forgotten belief still remain, while of what is lost something has been recorded by gleaners of these survivals of an older faith.

The succession of racial migrations and invasions which the British Isles have witnessed has superimposed culture upon culture. These the archaeologist, the ethnologist, and the folklorist seek to recover and differentiate. For this purpose the festivals of the calendar are one of the most fruitful sources. The ritual observances of a primitive people being associated with their chief preoccupa-

tion, the conservation of the food supply and the propitiation of the deified forces of Nature, centre around certain crucial seasons of the year, seed time and harvest, the summer and winter solstice, and the spring and autumn equinox. Transformed and degraded, their meaning forgotten, they survive in association with certain days and seasons in the Christian calendar. So beneath our Christmas lies the Saxon Yule. A saint's day may hide the festival of a Celtic goddess.

#### The Flow of Water.

- (1) *Stream Gaging*. By William Andrew Liddell. Pp. xiv + 236. New York: McGraw-Hill Book Co., Inc.; London: McGraw-Hill Publishing Co., Ltd., 1927.) 15s. net.
- (2) *Hydraulics*. By Prof. Ernest W. Schoder and Prof. Francis M. Dawson. Pp. xvi + 371. (New York: McGraw-Hill Book Co., Inc.; London: McGraw-Hill Publishing Co., Ltd., 1927.) 17s. 6d. net.
- (3) *Hydraulics: a Text-book covering the Syllabuses of the B.Sc. (Eng.), A.M.Inst.C.E., and A.M.I.Mech.E. Examinations in this Subject*. By E. H. Lewitt. (Engineering Degree Series.) Pp. xii + 372. (London: Sir Isaac Pitman and Sons, Ltd., 1927.) 10s. 6d. net.
- (4) *Modern Waterworks Practice*. By F. Johnstone Taylor. Pp. 272. (London: Ernest Benn, Ltd., 1927.) 18s. net.

THE control of water is one of the oldest branches of civil engineering, and to-day problems connected with the flow of fluids are of first importance in connexion with many scientific and technical activities. Like the engineers of ancient times, the modern engineer has to control the flow of water in canals and aqueducts; where they constructed small reservoirs, he constructs to-day reservoirs of very great capacity. The ancients drew water from shallow wells by primitive means; the engineer to-day uses deep well power-driven pumps to draw water from strata hundreds of feet below the surface of the earth. For thousands of years the power of flowing streams has been utilised to work simple machines, but to-day the rains that fall on the mountain areas are directed into channels that convey the water to machines developing tens of thousands of horse-power.

So important has a knowledge of the laws governing the control and flow of fluids become, that in the training of students of nearly all branches of engineering the subject of hydraulics, embracing the fundamental principles of hydro-