

ENCYCLOPÆDIA BRITANNICA.

DEA—DEA

DEACON (*διάκονος*, minister, servant), the name given to the lowest order of minister in the Christian church. From the appointment of the seven Hellenic deacons (Acts vi.) we learn that their duty under the apostles was simply to distribute alms from the public fund. In the early church, however, they soon came to discharge higher functions. They assisted the bishop and presbyter in the service of the sanctuary; in the administration of the Eucharist they handed the elements to the people; they instructed the catechumens, and in some cases baptized; and the archdeacons came to exercise in the 6th century the judicial power of the bishop over the inferior clergy.

In the Church of England the form of ordaining deacons declares that it is their office to assist the priest in the distribution of the holy communion; in which, agreeably to the practice of the ancient church, they are confined to the administering of the wine to the communicants. A deacon in England is not capable of holding any benefice, yet he may officiate as a private chaplain, as curate to a beneficed clergyman, or as lecturer in a parish church. He may be ordained at twenty-three years of age, *anno currente*; but it is expressly provided that the bishop shall not ordain the same person a priest and deacon on the same day. In Presbyterian churches, as in apostolic times, the deacons have charge only of the pecuniary affairs of the congregation. In the Roman Catholic Church it is the deacon's office to incense the officiating priest or prelate; to lay the corporal on the altar; to receive the paten or cup from the subdeacon, and present it to the person officiating; to incense the choir; to receive the pix from the officiating prelate, and to carry it to the subdeacon; and at a pontifical mass, when the archbishop gives the blessing, to put the mitre on his head, and to take off the archiepiscopal pall and lay it on the altar.

Deaconess.—This was the title of a ministry to which women were appointed in the early church, whose duty it was to perform certain functions towards female catechumens during the ceremony of baptism by immersion, which could not so well be performed by the deacons. Their age was at first fixed at sixty years, but it was afterwards reduced to forty years, and no married woman was eligible to the office. Abuses gradually became prevalent amongst the deaconesses which led to the suppression of

their ministry in the Latin church in the 6th century. The office was abolished in the Greek church in the 12th century.

DEAD SEA, the largest lake in Palestine, and physically, as well as historically, among the most remarkable in the world. It is called in Scripture *The Salt Sea* (Gen. xiv. 3), *The Sea of the Plain*, or more correctly of the *Arabah* (Deut. iii. 17), and *The East Sea* (Ezek. xlvii. 18). Josephus calls it the *Asphaltic Lake* (B. J. iii. 10, 17), a name adopted by classic writers in allusion to the bitumen, or asphaltum, which abounds in its basin. Jerome gave it the name *Dead Sea* because its waters are fatal to animal life, and in the Talmud it is called the *Sea of Sodom*. Its common name among the inhabitants of Palestine is *Baheiret Lât*, "The Sea of Lot."

The sea is 46 miles long, and varies from 5 to 9 in breadth. Its bed is the lowest part of the great valley of the Jordan; and its surface has a depression of no less than 1308 feet beneath the level of the ocean. The Jordan valley itself, for a distance of about 80 miles to the northward and 30 to the southward, is also below the level of the ocean. The general contour of the sea is an elongated oval, with a number of bold promontories and deep bays along the western shore, and a large, low peninsula on the south-east. It is shut in on the east and west by parallel ranges of mountains which rise steeply, and in some places in precipices of naked rock, from the water. The western range is the mountain chain of Judah, and is composed of white limestone intermixed with yellow and reddish strata. Its whole eastern slopes are bare, rugged, and desolate, forming that wilderness in which David found an asylum, in which the Baptist preached, and in which our Lord was tempted. The average height of the cliffs along the shore is about 2000 feet; but they are deeply fissured by torrent beds, which are all dry in summer. There are, however, a few fountains in the glens and near the shore, the most celebrated of which is the Biblical Engedi. At the north-west curve of the sea are extensive salt marshes, and at the south-west is a range of hills of rock salt, 7 miles long and 300 feet high, called *Khashm Usdom*, "The ridge of Sodom." On the south of the sea lies a low marshy plain, partially covered with jungles of reeds, tamarisk, and broom.

The mountain range along the eastern side of the Dead Sea is the sustaining wall of the tableland of Moab, which has an elevation of about 2800 feet, and is therefore 4000 feet above the lake. At the southern end the range is composed of red sandstone, a continuation of the "red" mountains of Edom. At the valley of Kerek the sandstone gives place to limestone; but further north it again appears in thick strata below the limestone. The range is intersected by the deep and wild ravines of Kerak (the *Kir-Moab* of the Bible), Mojeb (the ancient *Arnon*), and Zerka Main (*Maon*). A few miles from the mouth of the latter are the warm springs of Callirrhoe, famous in Jewish and Roman times. A copious stream of warm sulphureous water flows into the lake between stupendous cliffs of sandstone. North of Zerka Main the cliffs along the shore are sandstone, but higher up the limestone overlies the sandstone, while dykes and seams of old trap-rock also occur.

At the mouth of the ravine of Kerak, on the south-east of the sea, is the peninsula of *Lisan*, "The Tongue." Its neck is a strip of bare sand about 3 miles broad. In form the peninsula bears some resemblance to the human foot, the toe projecting northward up the centre of the sea. Its length is about 9 miles. It is a post-tertiary deposit of layers of marl, gypsum, and sandy conglomerate; the surface is white and almost destitute of vegetation.

The Jordan enters the lake at the centre of its northern end, and has on each bank a low alluvial plain, now a desert, and mostly coated with a white nitrous crust. In fact the whole circuit of the lake is wild, dreary, and desolate. Ridges of drift mark the water-line, which rises a few feet in spring, when the Jordan, fed by the melting snows of Hermon, flows in full stream. The drift is composed of broken canes and willow branches, with trunks of palms, poplars, and other trees, half-imbedded in slimy mud, and covered with incrustations of salt. Lying in a deep cavity, shut in by naked white hills, exposed during the long summer to the burning rays of an unclouded sun, nothing could be expected on the shores of the Dead Sea but sterility. Yet here and there on the low plains to the north and south, and on the eastern and western sides, wherever a little fountain springs up, or a mountain streamlet flows, there are thickets of willow, tamarisk, and acacia, among which the birds sing as sweetly as in more genial climes. The Arab also pitches his tent beside them, and sometimes cultivates a few patches of grain and tobacco. The heat causes such excessive evaporation that though the Jordan and other smaller streams fall into the lake the water seems to be gradually decreasing. The marshes along the shore, especially to the north and south, emit pestilential exhalations during summer and autumn which are fatal to strangers, and which make the inhabitants of Jericho, and the few poor tribes who pitch their tents in the surrounding territory, weak and sickly. They are degraded and immoral also, as were their progenitors in the "cities of the plain."

The only ruin of note close to the Dead Sea is the fortress of Masada, on a cliff on the western shore, opposite the peninsula of *Lisan*. It was the scene of the final struggle between the Jews and the Romans after the destruction of Jerusalem by Titus. At Engedi there are a few ruins; and also at Ain-el-Feshkhah on the north-west, and on a little peninsula near the mouth of the Jordan. The ruins of Sodom and Gomorrah have entirely disappeared. Their site is disputed, for some hold that they stood near the northern end of the lake, while others affirm that they must have been situated at the southern end.

The bed of the Dead Sea is divided into two sections; the northern, extending from the mouth of the Jordan to the peninsula of *Lisan*, is 33 miles long, and is a regular basin-shaped cavity, its sides descending steeply and uniformly

to a depth of 1308 feet. The southern section is shallow, the greatest depth of the channel between the peninsula and the western shore being only 13 feet, while no part of the lake south of the peninsula is more than 12 feet, and most of it only 3 or 4 feet deep.

The water is intensely salt and bitter, and its density is so great that the human body will not sink in it. The following is an analysis of water lifted by Captain Lynch from a depth of 1110 feet, the specific gravity of which was 1.227:—

Chloride of calcium.....	3.107
Chloride of magnesium.....	14.889
Chloride of sodium.....	7.855
Chloride of potassium.....	0.658
Sulphate of lime.....	0.070
Bromide of potassium.....	0.137

Total..... 26.416

The presence of so much saline matter is accounted for by the washings of the salt range of Sodom, the numerous brackish springs along the shore, and the great evaporation. The reports of early travellers, however, regarding the Dead Sea were to a great extent fabulous. They represented it as an infernal region, its black and fetid waters always emitting a noisome vapour, which being driven over the adjoining land destroyed all vegetation; they also stated that no birds could fly over it. All this is untrue; the water is as transparent as that of the Mediterranean and a bath in it is both pleasant and refreshing.

The historical notices of the Dead Sea extend back nearly 4000 years. When Lot looked down from the heights of Bethel, he "beheld all the plain of the Jordan that it was well watered, before the Lord destroyed Sodom, even as the garden of the Lord" (Gen. xiii. 10). The region is further described as a "deep valley" (*Emek*, Gen. xiv. 3, 8), distinguished by "fertile fields" (*Siddim*). The aspect now is entirely different. There must have been a lake then as now; but it was smaller, and had a margin of fertile plain, especially on the southern end, "as thou comest unto Zoar." In the narration of the capture of the cities of the plain by the Eastern kings, it is said that they were situated in the "vale of Siddim," which was full of "bitumen (slime) pits." When the cities were destroyed, "the Lord rained upon Sodom and upon Gomorrah brimstone and fire from the Lord out of heaven;" and Abraham from the mountain ridges "looked toward Sodom, and toward all the land of the plain, and lo, the smoke of the country went up as the smoke of a furnace" (Gen. xix. 24, 28). The sacred writer further asserts regarding the vale of Siddim that it became the Salt Sea, or was submerged; and consequently it now forms part of the bed of the lake.

These events entirely changed, as it would seem, both the political and physical condition of the whole region. Upon the plains originally existing round the sea Gentile and Jewish records combine in placing the earliest seat of Phœnician civilization. "The Tyrians," says Justin, "first dwelt by the Syrian lake before they removed to Sidon." Sodom and Gomorrah are mentioned as the first cities of the Canaanites; and when Lot went down from Bethel "the cities of the plain" formed a nucleus of civilized life before any city, except Hebron and perhaps Jerusalem, had sprung up in central Palestine. The great catastrophe in the days of Abraham changed the aspect of the country, and gave a death-blow to its prosperity. With the exception of the village of Engedi, and the small town of Jericho, the circuit of the Dead Sea appears to have remained ever afterwards almost without settled inhabitants.

Recent researches, especially those of M. Lartet, the Duc de Luynes, and Canon Tristram, have contributed greatly to our knowledge of the physical geography of the Dead Sea basin. It is now shown from the geological

structure of the watershed in the valley of the Arabah to the south, and from the direction of the lateral ravines which fall into the great Jordan valley, that the river Jordan could never have run into the Red Sea. The depression of the Dead Sea is 1308 feet, while the elevation of the watershed is 787 feet; and the action which upheaved the watershed occurred at the same geological period which gave to the whole of Palestine its present form. The formation of the Jordan valley M. Lartet accounts for in this way. At some remote period a fracture took place in the upper strata in this region, extending north and south. In consequence of the unequal strength of the strata the western side of the fracture sank, occasioning the abrupt dip observable in the strata on the western side of the valley, and the great depression of the valley itself; while the eastern side of the fracture remained *in situ*, showing at various places along the eastern shore of the Dead Sea a vertical section through the limestone and sandstone. The basin of the Dead Sea has thus been since its foundation a reservoir for the rainfall; while its saltiness originally proceeded from the salt-spring and hills, and gradually increased by evaporation.

Deposits of great depth have accumulated in the whole valley since its formation, composed of beds of gypsum, marl, flint, and alluvium, similar to those now in process of formation at the bottom of the Dead Sea. They show that at one period the whole Jordan valley was under water; while the sides of the valley indicate successive stages in the fall of the water from the time when its surface was on the level of the ocean down to the present age. The hill-sides and strips of plain on both the eastern and western banks of the Dead Sea are marked by a series of terraces or shore-lines. The highest has an elevation corresponding to the level of the Mediterranean. About 230 feet above the present level of the lake there is another shore-line, marked by a strip of alluvial marl adhering to the rocks and cliffs, particularly at the north-west angle. The deposit is mixed with shells of existing species, layers of gypsum and gravel. This line would correspond with the general level of the great valley northward, through which the river Jordan has cut a deep channel. There are, besides, in the ravines which descend to the lake, comparatively recent deposits, reaching up their sides in places to a height of 400 feet, and then sloping down in a series of terraces to the present level of the lake, showing the gradual depression of the water. Tristram also remarked on the western shore "no less than eight low gravel terraces, the ledges of comparatively recent beaches, distinctly marked. The highest of them was 44 feet above the present sea-level."

Many traces of volcanic action, both remote and recent, have been observed in the basin of the Dead Sea, such as trap dykes, and hot sulphur and brackish springs. Tristram describes a valley at the northern end of the salt range of Sodom, in which there are

"large masses of bitumen mingled with gravel. These overlie a thick stratum of sulphur, which again overlies a thicker stratum of sand so strongly impregnated with sulphur that it yields powerful fumes on being sprinkled over a hot coal. The bitumen, unlike that which we pick up on the shore, is strongly impregnated with sulphur. Above all, it is calcined, and bears the marks of having been subjected to extreme heat. So far as I can understand this deposit, if there be any physical evidence left of the catastrophe which destroyed Sodom and Gomorrah, or of similar occurrences, we have it here. The whole appearance points to a shower of hot sulphur, and an irruption of bitumen upon it, which would naturally be calcined and impregnated with its fumes; and this at a geological period quite subsequent to all the diluvial and alluvial action of which we have such abundant evidence. The catastrophe must have been since the formation of the valley, and while the water was at its present level,—therefore, probably during the historic period." (*Land of Israel*, pp. 355, sq.)

Tristram applies the above-observed facts to the solution

of the great historical question about the destruction of the cities of the plain in the following manner:—

"Setting aside all preconceived notions, and taking the simple record of Genesis xix. as we find it, let us see whether the existing condition of the country throws any light on the Biblical narrative. Certainly we do observe by the lake sulphur and bitumen in abundance. Sulphur springs stud the shores, sulphur is strewn, whether in layers or in fragments, over the desolate plains; and bitumen is ejected in great floating masses from the bottom of the sea, oozes through the fissures of the rocks, is deposited with gravel on the beach, or appears with sulphur to have been precipitated during some convulsion. We know that at the time of earthquakes bitumen seems to be detached from the bottom of the lake. Everything leads to the conclusion that the agency of fire was at work. The kindling of such a mass of combustible material, either by lightning from heaven, or by other electrical agency, combined with an earthquake ejecting other bitumen or sulphur from the lake, would soon spread devastation over the plain, so that the smoke of the country would go up as the smoke of a furnace." (*Land of Israel*, p. 359).

Here we have to do only with physical facts and appearances. A mass of burning sulphurous matter might be ejected from some open crater, as is often the case with Vesuvius; and this, falling upon the cities and the bituminous plain around them, would produce just such a form of conflagration as Abraham is stated to have seen. The valley may then have sunk a few feet, and become submerged. This, it is true, is mere theory; it is a theory, however, suggested, and to a large extent confirmed, by the physical aspect of the country, and the careful observations of travellers around the lake. The subject is not one for vague speculation, and much less for dogmatic assertion. The problems which the Dead Sea present must be solved, if they are ever to be solved, by scientific research.

It is not strange that the Dead Sea has never been navigated to any extent. It seems probable from the statement of Josephus (*Ant.* ix. 1, 2) that the Moabites crossed it to invade Judah; and he tells us the Romans used boats against the fugitive Jews (*B. J.* iv. 7, 6). Costigan was the first in modern times to navigate it, going from the mouth of the Jordan to the peninsula of *Lisan* in the boat by which he had come from Tiberias. He afterwards died of fatigue and exhaustion. In 1837 Moore and Beck conveyed a little boat from Joppa, and visited some points. Ten years later Lieutenant Molyneux took a boat to the peninsula, and his life was also sacrificed. The expedition of Lynch was far more successful, and he was the first thoroughly to examine the shores, and to determine the depths by soundings. Several of his party took the fever which is so fatal, and one died. Winter is the proper season for such researches. Rain seldom falls; and the air during the depth of winter is fresh, and cold almost unknown.

The following are the leading works which treat of the Dead Sea:—Robinson, *Physical Geography of Palestine*; De Sanley, *Voyage autour de la Mer Morte*; Lynch, *Official Report to United States Government*; Ritter, *Comparative Geography of Palestine*, vol. iii. appendix i. (J. L. P.)

DEADLY NIGHTSHADE. See BELLADONNA.

DEAF AND DUMB. It is a not uncommon supposition that deaf mutes are dumb on account of some vocal or organic defect, whereas the dumbness arises, with very rare exceptions, from the deprivation of hearing caused by some natural or accidental disease. Where partial or total dumbness exists with the sense of hearing perfect, it will be generally found to proceed either from great nervous debility or from some mental derangement, and not, as is often supposed, from some defect in the vocal organs, which in the congenitally deaf, with hardly an exception, are in their normal condition. Many children who are enumerated as congenitally deaf have the sense of hearing to a greater or less degree, but not to such an extent as to be of service to them in the acquisition of language. It is remarkable that the defect of hearing is not generally dis-