



principle of the treatise is that, as the Bible is a revelation from God of things that man could not have found out for himself, all that the Bible says on any matter is to be accepted implicitly, in the plain sense of the words, and without sophistication, however strange it may seem to the natural human reason. Hence, in all those essentials of Christianity which consist in the doctrines of the fall of man, atonement by Christ, and restoration and sanctification through Christ only, Milton is at one with the great body of Christians. Altogether, what the treatise makes clear is that, while Milton was a most fervid theist and a genuine Christian, believing in the Bible, and valuing the Bible over all the other books in the world, he was at the same time one of the most intrepid of English thinkers and theologians.

For further information reference may be made to Masson's *Life of Milton and History of his Time*, 6 vols. (1859-80), and to his editions of *Milton's Poetical Works* (Cambridge edition in 3 vols., 1874, and smaller 3 vol. ed., 1882), as well as to Todd's variorum edition of the *Poetical Works*, with *Life* (2nd ed., 1852), to Keightley's *Life, Opinions, and Writings of Milton* (1835), to *Milton and his Time*, by Alfred Stern (1877-79), and to Mr Mark Pattison's *Milton in Mr Morley's series of "English Writers"*. Collective editions of the prose works since that of 1698 are—Symmons's (7 vols., 1806); Pickering's, with *Life* by Milford (8 vols., prose and verse together, 1851); and St John's, in Bohn's Standard Library (6 vols., 1848-53). This last includes a revised edition of Bishop Sumner's translation of the *Treatise of Christian Doctrine*, originally published in 1825. (D. MA.)

MILWAUKEE, the largest city in the State of Wisconsin, United States, is situated on the west shore of Lake Michigan, 100 miles north of its southern end, 80 miles north of Chicago, and 1000 miles north-west of New York by rail, in 43° 3' N. lat., 87° 56' W. long. (44 min. W. of Washington). The shore of the lake is 600 feet above the level of the sea.

The Milwaukee and Menomonee rivers unite in the centre of the business portion of the city, about half a mile from their entrance to Lake Michigan, where they are joined by a third and smaller stream—the Kinnikinnic. A bay 6 miles from cape to cape, and 3 miles broad,



Plan of Milwaukee.

stretches in front of the city, which commands a fine water view, the ground rising along the shore 80 feet above the level of the lake, then gradually sloping westward to the Milwaukee river, and again rising on the west and north to a height of 125 feet. The ground also rises to a commanding elevation south of the valley of the Menomonee. Few cities present so many natural attractions of site,

as indeed its Indian name indicates ("the beautiful hollow or bay"); and art has added to nature. In the residence parts of the city there are miles of avenues from 70 to 100 feet wide, lined on both sides with elms and maples, behind which stand handsome houses with spacious lawns, fountains, and evergreens, giving the appearance of a continuous park. The material used for building is largely the cream-coloured brick made in the vicinity, from which Milwaukee is sometimes called the "Cream City." The climate, tempered by the great lake, is remarkably pleasant and healthy. The mean temperature, as shown by the records of twenty years, is 46°·7 Fahr. The coldest month is January (average 22°·37), the hottest July (70°·4).<sup>1</sup> During the last nine years the average death-rate has been but 20 per 1000, showing it to be one of the healthiest of American cities. Besides a full complement of the usual religious and charitable institutions, there is adjoining the city the national home for disabled United States volunteer soldiers, consisting of several buildings situated in grounds of 400 acres extent, which serve the purpose of a city park. There are numerous lodges belonging to the freemasons and other guilds; and the Turners' societies, which embrace a large membership and own some valuable buildings, have done much to create and keep up the practice of athletic exercises among the citizens. Two excellent musical societies are also established here.

Before the year 1835 Milwaukee was known only as an Indian trading-post occupied by a Frenchman named Solomon Juneau, who is generally spoken of as the founder of the city. The total inhabitants in 1838 numbered only 700; in 1840 there were 1712; but in 1846 the population amounted to 9666, in 1850 to 20,061, in 1855 to 30,118, in 1860 to 45,246, in 1870 to 71,440, and in 1880 to 115,578 (57,475 males, 58,103 females). In 1882 the population was estimated at 130,000,—more than one half of them of foreign parentage, a very large majority being Germans. Notwithstanding the multitude of nationalities represented in the population, there are few cities more orderly and law-abiding, the number of police employed being less than one for every 1500 inhabitants. Another feature worthy of mention is the large proportion of families who own their own houses, and this is true not only as to the mercantile and professional classes, but especially as to the labouring population. Although the grain trade, formerly very large here, has now greatly diminished, the growth and prosperity of the city have not materially suffered, owing to the development of manufacturing industries, for which the low rents, healthy climate, and advantageous location make it well adapted. About a sixth of the population are engaged in the manufacture of clothing, cigars, cooperage, leather, bricks, sashes, doors, and blinds, machinery, and flour (of which one million of barrels are annually made), and in meat-packing. Milwaukee has become famous for its "lager beer," of which there are one million of barrels annually produced, valued at \$8,000,000. The lake commerce is very large. The tonnage entered and cleared in 1880 was 5,322,373 tons, being about as large as that of Baltimore, Boston, or Philadelphia. The Wisconsin Central, the Milwaukee and Lake Shore, the Milwaukee and Northern, and the Chicago, Milwaukee, and St Paul Railways have their head offices here, and the last-named, owning 4000 miles of lines, has immense workshops in the Menomonee valley near the city.

Milwaukee is governed by a mayor and a common council of thirty-nine aldermen. The streets and public buildings are under the charge of the board of public works,

<sup>1</sup> The monthly averages for twenty years are:—January, 22°·37; February, 25°·13; March, 33°·35; April, 43°·94; May, 53°·75; June, 64°·39; July, 70°·04; August, 67°·89; September, 61°·68; October, 48°·48; November, 36°·27; December, 25°·53.

composed of three commissioners and the city engineer, all subject to the common council. A bountiful supply of water is obtained from the lake, and the streets are well supplied with sewers. The value of property as assessed for taxation was \$62,000,000 in 1882,—the city debt being \$2,500,000, mostly for the water-works, which are city property.

There is an efficient system of public schools under a superintendent and board of school commissioners, the value of the buildings with their sites being estimated at \$700,000. For the higher education there are a high school, a normal school, and three commercial colleges, while the Roman Catholics and Lutherans have several excellent denominational seminaries and colleges. A public library belonging to the city contained 20,000 volumes in 1882.

MIMICRY is the name given in biology to the advantageous resemblance (usually protective) which one species of animal or plant often shows to another. The word was first applied in this metaphorical sense by Mr W. H. Bates, and it has since been accurately defined and limited, in its biological application, by Mr A. R. Wallace. Briefly put, the essence of the phenomenon of mimicry consists in the following relation. A certain species of plant or animal possesses some special means of defence from its enemies, such as a sting, a powerful and disagreeable odour, a nauseous taste, or a hard integument. Some other species inhabiting the same district or a part of it, and not itself provided with the same special means of defence, closely resembles the first species in all external points of form and colour, though often very different in structure and unrelated in the biological order. For example, a South-American family of butterflies, the *Heliconidae*, are distinguished by their very varied and beautiful colours, and their slow and weakly flight; they might easily be captured by insectivorous birds, but their remains are never found on the ground amongst the rejected wings of other butterflies which cover the soil in many places. They also possess a strong pungent odour, which clings to the fingers for many days; and this fact led Mr Wallace to suspect that they have a disagreeable taste, and would not therefore be eaten by birds after a single trial. Mr Belt has since experimentally proved the truth of that belief. But among the totally distinct family of the *Pieridae*, most of which are white, there is a genus of small butterflies, known as *Leptalis*, edible by birds, some species of which are white like their allies, while the greater number exactly resemble one or other of the *Heliconidae* in the peculiar shape and colouring of their wings. As regards structure, the two families are widely different; yet the resemblance of a species of one family to a species of the other is often so close that Mr Bates and Mr Wallace, experienced entomologists, frequently mistook them for one another at the time of capture, and only discovered their mistake upon nearer examination. Mr Bates observed several species or varieties of *Leptalis* in the Amazon valley, each of which more or less exactly copied one of the *Heliconidae* in its own district. Accordingly, they seem to be mistaken by birds for the uneatable insects they mimic, and so to be benefited by their resemblance. This, which may perhaps be regarded as the most typical instance of true mimicry, is also the first to which the word was applied.

In considering the phenomena under review, it may be well to give first the chief observed facts, which are quite independent of any particular explanation, and then the theory which has been started to account for them by Mr Bates and Mr Wallace. Before doing so, however, true mimicry should be carefully discriminated from one or two superficially similar modes of resemblance among organic beings, whose real implications are very different.

It must not be confused with mere accidental or adaptive resemblance, due either to simple chance or to similarity of external conditions. As a case of the first sort, we may adduce the real or fancied resemblance between certain orchids and flies or spiders; as a case of the second sort, we may take certain African *Euphorbiaceae*, which, growing in dry deserts, have acquired a very close likeness to the cactuses that cover the equally dry deserts of Mexico; or again the sub-Antarctic gallinaceous bird, *Chionis alba*, which, living on the sea-shore, has acquired a coloration like that of the gulls, together with the legs of a wader. These resemblances, however, do not as such subserve any function. The species apparently mimicking and the species apparently mimicked either do not inhabit the same district or do not come into any definite relation with one another. The likeness is either accidental, or else it is due to similar adaptation to similar circumstances. In cases of true mimicry, on the other hand, the mimicking species derives a direct advantage from its likeness to the species mimicked; the resemblance is deceptive; and this is equally true whether we suppose the mimicry to be produced by creative design or by natural selection. On either hypothesis, however it came by its likeness, the mimicking species escapes certain enemies or obtains certain sorts of food by virtue of its resemblance to some other kind.

It should also be added that the word mimicry, as applied to such cases, is used only in a metaphorical sense. It is not intended to imply any conscious or voluntary imitation by one species of the appearance or habits of another. All that is meant is the fact of an advantageous resemblance, a delusive similarity, which gives the mimicking animal or plant some extra protection or some special means of acquiring food which it would not otherwise have possessed but for its likeness to the creature mimicked.

Taking animals first, mimicry does not occur very frequently among the higher classes. In the vertebrates it is comparatively rare, and among mammals probably only one good case has yet been adduced. This is that of *Cladobates*, an insectivorous genus of the Malayan region, many species of which closely resemble squirrels in size, in colour, and in the bushiness and posture of the tail. It has been suggested by Mr Wallace (from whom most of the following examples have been borrowed) that *Cladobates* may thus be enabled to approach the insects and small birds which form its prey under the disguise of the harmless fruit-eating squirrel. In this case, as in some others, the resemblance is not protective, but is apparently useful to the animal in the quest for food.

Among birds, Mr Wallace has pointed out that the general likeness of the cuckoo, a weak and defenceless group, to the hawks and gallinaceous tribe makes some approach to real mimicry. But besides such vague resemblances there are one or two very distinct cases of true mimicry in this class of vertebrates. In Australia and the Moluccas lives a genus of dull-hued honey-suckers, *Tropidorhynchus*, consisting of large, strong, active birds, with powerful claws and sharp beaks. They gather together in noisy flocks, and are very pugnacious, driving away crows and even hawks. In the same countries lives a group of orioles, forming the genus *Mimeta*; and these, which are much weaker birds, have not the usual brilliant colouring of their allies the golden orioles, but are usually olive-green or brown. In many cases species of *Mimeta* closely resemble the *Tropidorhynchi* inhabiting the same island. For example, on the island of Bouru are found the *Tropidorhynchus bouruensis* and *Mimeta bouruensis*, the latter of which mimics the former in the particulars thus noted by Mr Wallace:—"The upper and under surfaces of the two birds are exactly of the same tints of dark and light brown. The *Tropidorhynchus* has a large