

seen that Norway heads the list. In Norway a larger proportion of infants survive than in any other country, and when grown up these infants display the greatest power of endurance that statistics acquaint us with. A thousand years spent in the growing period produce 63 per cent more of working life among the Norwegians than among the Irish, and 13 per cent more than among American men, while the same expenditure among American men produces a return of 44 per cent higher than in Ireland. But it will be noticed that, in the case of the United States throughout, only men are referred to, while in every other case both sexes are included, mortality in America being higher among women than men.

### LIFE IN OTHER WORLDS.

(By Mr. R. A. Proctor, in the *Day of Rest*)

But let us next consider what is the probability that there is life on some member or other of a scheme of worlds circling round any given sun. Here, again, the argument is from analogy, being derived from what we have learned or consider probable in the case of our own system. And I think we may adopt as probable some such view as I shall now present. Each planet, according to its dimensions, has a certain length of planetary life, the youth and age of which include the following eras—a sunlike state; a state like that of Jupiter or Saturn, when much heat, but little light is evolved, a condition like that of our earth; and lastly the stage through which our moon is passing, which may be regarded as planetary decrepitude. In each case of world-existence the various stages may be longer or shorter, so that speaking generally the period of habitability bears the same proportions in each world to the whole period of its existence; or perhaps there is no such uniform proportion, while, nevertheless there exists in all cases that enormous excess of the period when no life is possible over the period of habitability. In either case, it is manifest that regarding the system as a whole, now on, now another planet (or more generally, now one, now another member of the system) would be the abode of life, the smaller and short-lived having their turn first, then larger and larger members, until life has existed on the mightiest of the planets, and even at length upon the central sun himself. We need not concern ourselves specially with the peculiarities affecting the succession of life in the case of subordinate systems, or of the members of the asteroidal family, or in other cases when we have little real knowledge to guide us, the conclusion remains the same, that life would appear successively on planet after planet, step by step from the smaller to the larger, until the approach of the last scene of all, when life would have passed from all the planets, and our sun would alone remain to be in due time inhabitable, and then in turn to pass (by time-intervals to us practically infinite) to decrepitude and death. During all this progression, the intervals without life would in all probability be far longer than those when one or another or other planet was inhabited. In fact, the enormous excess of the lifeless periods for our earth over the period of habitability, renders the conclusion all but certain that the lifeless gaps in the history of the solar systems must last very much longer than the periods of life (in this or that planet) with which they would alternate. If we apply this conclusion to the case of any given star or sun with its scheme of dependent worlds, we see that even for a solar system so selected at random the probability of the existence of life is small. It is, of course, greater than for a single world taken at random—just as if I had ten friends who were to be at home each for six minutes between noon and ten, the chance would be greater that some one of the number would be at home at a given moment of that interval than would be the chance that a given one of the number would be then at home; while yet even taking all the ten it would still be more likely than not that at that moment not one would be at home. Thus when we look at any star, we may without improbability infer that at the moment that star is not supporting life in any one of those worlds which probably circle around it. Have we then been led to the Whewellite theory that our earth is the sole abode of life? Far from it. For not only have we adopted a method of reasoning which teaches us to regard every planet in existence, every moon, every sun, every orb in fact in space, as having its period as the abode of

life, but the very argument from probability which leads us to regard any given sun as not the centre of a scheme in which at this moment there is life, forces upon us the conclusion that among the millions upon millions, nay, the millions of millions of suns which people space, millions have orbs circling round them which are at this present time the abode of living creatures. If the chance is one in a thousand in the case of each particular star, then in the whole number (practically infinite) of stars, one in a thousand has life in the system which it rules over; and what is this but saying that millions of stars are life-supporting orbs? There is then an infinity of life around us, although we recognise infinity of time as well as infinity of space as an attribute of the existence of life in the universe. And remembering that as life in each individual is finite, in each planet finite, and in each solar system finite, in each system of stars finite, so (to speak of no higher orders) the infinity of life itself demonstrates the infinity of barrenness the infinity of habitable worlds implies the infinity of worlds not as yet habitable, or which have long since passed their period of inhabitability. Yet is there no waste, whether of time, of space, of matter, or of force; for waste implies a tending towards a limit, so that of the illimitable there can be no waste.

THERE is now upon exhibition at Brady's docks, says the *Detroit Post*, a mammoth mass of native copper, brought down by the Pacific from Lake Superior, which possesses no little interest to scientific people and the public generally, from the fact that it bears unmistakable evidence of having been worked hundreds of years ago by the ancient miners, those primitive men who are supposed by many scientists to have been identical with the mound-builders. This huge mass of copper, which is 14 ft. long, 3 ft. thick, and irregular in shape, weighs over 6,000 lb. and was discovered in October last by Mr. A. C. Davis, of this city, a gentleman well known in mining interests and long engaged in developing the mineral resources of the Upper Peninsula. It was found in township 66, north of range 35 west, section 27, being on Isle Royale, in Keweenaw county, and was at the bottom of an ancient mining pit 10½ ft. deep. This excavation contained large quantities of charcoal and several cart-loads of the ponderous stone-hammers or mauls, weighing from 10 lb. to 30 lb. each, which were the chief tools with which the labour was performed. The marks made by their mauls in clipping off the wings or rough edges are distinctly visible upon the lump of copper found by Mr. Davis. At McCaughey's Cove, a deep inlet on the northern side of Isle Royale, there is a belt of rock carrying a rich vein of copper about three miles long, and from 25 ft. to 40 ft. in width, which was worked by the ancient miners, in some instances their pits being as close together as would allow. The relic of ancient mining found by Mr. Davis was upon valuable property owned by well-known Detroiters, among the number C. M. Garrison, S. G. Wight, Hiram Walker, Jacob Beaumont, A. W. Copland, and others. A stock company will be organized at once for the purpose of fully developing the mineral resources of the property. The specimen would be a rich acquisition to the cabinet of a scientific society, but its cash value is \$1,500, and it will probably be melted up. For the present it will remain on exhibition at Brady's dock.

### UTILIZATION OF SILK RAGS.

According to *Les Mondes*, one of the wealthiest English velvet manufacturers, Mr. Lister, worked his way to success by years of patient labor in search of a way to utilize silk rags. He began by buying up all such waste at less than a cent a pound; and up to the year 1864, he had expended the immense sum of \$1,312,500 in fruitless efforts to find a process. Nothing daunted, Mr. Lister continued his experiments; and within the past ten years, he has discovered a way of making the refuse into fine velvet. He carries on this industry at Man-ningham, Eng., in an establishment which employs not merely 4,000 workmen, but 293 travellers in all parts of the globe, whose sole business is to buy the silk waste. The factory is said to have cost nearly \$3,000,000.