

HOUSES IN GREAT CITIES.

(From the Mail.)

Dr. B. W. RICHARDSON, F.R.S., on Monday delivered the first of two lectures to the members of the London Institution on "Health Improvements in Great Cities." Later in the evening the subject of Ventilation was treated by Mr. Lanyon in a paper read at the Royal Institute of British Architects.

Dr. Richardson observed that for purposes of health the houses on this island require to be rebuilt or remodelled from Land's End to the Hebrides. He admitted that there is about some of them a certain element of beauty, but he had not been able to discover one house in the island constructed on a plan perfect for the requirements of the healthy existence of its inmates. We might date all our new knowledge on the subject from the time of Stephen Hales, rector of Teddington, who in 1733 published the first treatise in which the subject of the ventilation of houses is scientifically considered. The nature of gases was then not understood, for although the existence of oxygen had been dreamed of as nitro-aerial air, and Boyle had shown that ammonia exposed to the air seized some substance from the atmosphere which gave the new compound additional weight, the nature of "fixed air" was unknown, nor was it suspected to be a product of the human body, breathed out with every human breath. Yet by one of those simple series of observations which the fortunate and honest in science make for themselves, Hales measured the air we breathe, showed that the capacity of the human chest for containing it was 220 cubic inches, and discovered approximately the loss sustained in the lungs by the absorption of some part of the air, the nature of which he could not analyze. "Two gallons of air," he said, "breathed to and fro for 2½ minutes become unfit for respiration." This essay of Hales was the birth of modern sanitation. Nevertheless, years afterwards Pitt blinded and choked the nation by the window-tax. Sir John Pringle, in hospitals, Howard, in prisons, continued the work of Hales. Then came the chymical discoveries of Priestly and Black, and it was proved that the presence of vegetable existence to reabsorb carbonic acid is a necessity for perfect purification of the air. It was found that oxygen assumed new qualities in the form of ozone, and that the ozonized condition of the air was increased by its contact with vegetation, and by electrical discharges. Thus ventilation by itself was proved insufficient. The air must also be made active and vitalized. Sir Benjamin Brodie and Mr. Broughton placed living warm-blooded animals in chambers charged with simple oxygen, and arranged an alkaline solution to absorb the carbonic acid given out in breathing. But the animals became languid and drowsy and died in their sleep. Nevertheless, the oxygen supported the combustion of a taper. It was concluded that oxygen undiluted was a narcotic poison, but the lecturer found from some experiments that on using oxygen repurified over and over again warm-blooded animals ceased to live in it, though frogs could exist, while fresh supplies of oxygen were attended with no narcotic symptoms, and increased the appetite to voracity if the oxygen was at summer heat. He found after a prolonged inquiry that oxygen gas breathed in contact with oxygen that has been breathed loses some quality which destroys its power of sustaining natural life. In this deteriorated oxygen organic substances more rapidly decay. It may be restored by electric discharges. He further learnt that the presence in oxygen of various vapours and products of decomposition interferes with the vital action of oxygen in the same way, and had no doubt that the useful narcotic vapours employed to suspend sensation under operations depend on their faculty of arresting the vital action of oxygen. Air, in short, is rendered dangerous by carbonic acid, restored by plants, loses its active condition in great towns, and is devitalized by contact with other gases. For the purification of water society was indebted to Dr. John Snow, who 25 years gone by showed the relation of impure water to cholera, typhoid, and certain other spreading diseases. In 10,000 houses supplied by one company in Southwark and Vauxhall there were 97 fatal cases of cholera. In the same number of houses supplied with pure water by the Lambeth Company the fatal cases were five. Then it was discovered that dampness adds rheumatism and neuralgia to the list of painful and pulmonary consumption to the list of fatal as well as painful maladies. A fourth step related to the value of light. The actinic rays in vegetation are perpetual chymists to the world. They decompose the carbonic acid in the leaf, fix the carbon for the plant, give up the oxygen for the use of man. But it is not generally understood how refined and potent this influence is and how it is crossed by man. The noxious vapours, ven off from alkali works as chlorine. Hydro-chloric acid, and sulphurous acid reduce the activity of the chymical changes in plants, under the action of the sun. Mr. Lockyer, at the lecturer's request, made some experiments, which showed that this was effected by cutting off the rays which produced these changes. An eminent native physician of our Indian Empire sent Dr. Richardson some cobra poison fatal to animal life. But some that was exposed to the light became innocuous in a few days, while another portion which was wrapped in paper retained its virulent properties. This was an illustration of the importance of letting in the sunshine which would destroy the cobra poison, and by analogy such poisons as small-pox, scarlet fever, and typhus. The maintenance of an equable temperature is another requisite. The wave of cold that passes from time to time over our houses is so sharply destructive to life in certain ages as to kill by a kind of geometrical progression. If on persons above 30 years of age it produces an increase of mortality, the fatal effect doubles with every nine years of life. If it kill one person who has reached 30, it kills two of 39, four of 48, eight of 57, 16 of 66, 32 of 75, and 64 of those who have attained to 84. Pure air, pure water, purity from damp, pure daylight, equable temperature, these, said Dr. Richardson, are the five fingers and right hand of health. They are little known, but the knowledge exceeds the practice of them. The lecturer then entered on an interesting review of the difficulties which lie in the way of reform, difficulties closely connected with

the social as well as with the physical development of man. He said that the progressive development of practical learning in the building of houses of towns had been much modified and delayed by political causes. But political circumstances in England had now become very favourable to improvement.

(To be continued.)

THE VIRGINS OF GOD.

From the very beginning of Christianity there were women whose piety and zeal led them to imitate the Blessed Mother of God by a public profession of virginity. It is a sound tradition in the Church that St. Peter who consecrated the virginity of St. Petronilla, and that St. Thecla—who was also the first martyr of her sex—professed this holier state at the persuasion of St. Paul. The Roman Martyrology, which is one of the most venerable documents of ecclesiastical antiquity in existence, informs us, under date of the 21st of September, that St. Iphigenia, virgin, received baptism from St. Matthew, and by him was consecrated to God; and in the Acts of the Apostles we read of Philip's four daughters, who lived in holy virginity and were favored with the gift of prophecy. Pope St. Clement, who lived in the first age of the Church, gave the consecrated veil with his own hands to the virgin Flavia Domitilla, who was niece of the illustrious Consul Flavius Clemens, and belonged to the "household of Caesar," as a near relative to the Emperor Domitian.

Not one of the fathers of the first three centuries but alludes to this holy state; and from their writings, and especially from those of Tertullian and SS. Cyprian and Ignatius, it is clear that it was entered by a public profession and solemn consecration. The famous martyr and celebrated Bishop of Carthage whom we have mentioned composed a treatise "On the Dress of Virgins"—"*De Habitu Virginum*,"—in which he calls them "the flowers of the Church's family, and the noblest portion of the flock of Christ." In how great esteem even some heathens held those who lived this life is recorded by a pagan historian, Ammianus Marcellinus (xviii. 10), who says that during the war which was carried on about the middle of the third century between the Romans and Persians some Christian virgins having been captured and brought before King Sapor, he commanded that all should respect them, and permitted them to practise the religious exercises of their state.

At this early period, when Christians were harassed by almost continual persecutions, these holy women lived in their own houses, but apart from the world and carefully avoiding all secular conversation; and if their private means were not sufficient for a decent support, they were allotted a part of the oblations of the faithful.

In the fourth century, after peace had descended on the people of God, the number of virgins was greatly increased. From a homily of St. John Chrysostom (67 in Matt.), we learn that there were one thousand in the city of Constantinople alone. Now, also, monasteries and convents in which a life of community was followed were established both in the East and West. St. Anthony, abbot, opened such a house for religious women in Egypt, over whom he placed his sister; and several similar institutions were founded by St. Basil in Pontus and Cappadocia. In the fifth century, convents for women were immensely multiplied in the East; and with regard to the number of their inmates, Theodoret says in his "Ecclesiastical History" that he knew of one in which two hundred and fifty virgins lived together.

In the West, also, there were numerous houses of this kind; and such saints as Jerome, Athanasius, Eusebius of Vercelli, Augustine, and Ambrose were very solicitous to encourage the good resolutions of those who wished to devote themselves to the service of God in the state of virginity and in obedience to a rule. The last-named father erected a convent in Milan—among whose subjects was his sister Marcellina—which soon became so renowned for the virtue of its inmates and the sanctity of its founder that postulants came from every quarter of Italy, and even from Mauritania in Africa, to be professed therein and take the veil from that great bishop himself.

Wherever such a community of religious women was established, prayer, fasting, and manual labor were among the regulations; a brown habit and woollen girdle were worn; the canonical hours or office, which consisted principally of hymns and selections from the Psalms, was recited in common, and it was obligatory to go in a body to the church on Sundays and feast-days to assist at the Holy Sacrifice. A part of the sacred edifice was reserved exclusively for them. They were always under the supervision of the bishop.—*Ave Maria.*

It is rumoured in England that the Russians are being inflamed to a new crusade by an enthusiast who is like a reincarnation of Peter the Hermit, so fiery are his utterances, and so insanely devout his purpose. This man is described as a very wealthy citizen of Moscow, formerly in the Russian army, who declares he has a mission from God to rouse the Russians to a holy war which shall sweep the Turks from Europe and release the Slavs from their oppressors. Beginning at Moscow, where the council granted some millions of roubles towards the military preparations, this prophet went southward to the Czar's seat of Livadia, and there announced to him the will of the Most High, Prince Gortschakoff in introducing him to the presence. Since then the preacher tells the populace that he is permitted to say that the "father of his people" will not fail the cause of God at the coming crisis. When he returned to Moscow, it was the triumph of a conqueror. The magistrates, municipal councils, and the corporations headed a procession of the inhabitants that flocked to lead him in. This is a wild story, but we cannot say an impossible one.