HIPPOCRATES AND THE NEWLY-DISCOVERED HEALTH TEMPLE OF COS.

Abstract of a Lecture delivered at the Royal Institution.

By RICHARD CATON, M.D., F.R.C.P.,
Liverpool.

AFTER exhibiting three portraits of Hippocrates and giving a brief sketch of his work at Cos, his influence in freeing medicine from ancient superstition, his marvellous powers of observation and scientific insight, and his lofty conception of the aims which ought to characterize the physician, Dr. Caton showed photographs of Cos and of the ancient tree under which, according to tradition, Hippocrates was accustomed to give medical advice and counsel to the people in the town of Cos. He then traced the sacred way which leads to the Asklepieion, or Health

with the building of various churches and mosques, had so completely masked the site that until three years ago not a living soul knew that the *παλαιὰ τῆς τάφρου* with the gardens round it was the site of the famed Asklepieion. Two British archaeologists, Mr. W. R. Paton and Mr. E. L. Hicks, while searching Cos for inscriptions, with much acuteness suggested this as a probable site. The situation is a remarkably beautiful one, commanding delightful views on all sides. Standing on three step-like terraces, the buildings at present excavated are about 180 metres in length from north to south, and about 129 from east to west. The spectator sees to the south the range of mountains I have mentioned. To the north the verdant plain of Cos, with the white houses and trees of the town to the right, and the wide expanse of turquoise sea dotted by the purple islands of the Aegean and the dim mountains about Halicarnassus to the north-east.

Fig. 1.—Health Temple, restored.

Temple. Before describing the remains of this great Coan sanctuary, which the labours of Dr. Rudolph Herzog, of Tübingen, have brought to light during the past two years, Dr. Caton briefly recounted, for purposes of comparison, the principal temples and sanitary departments of such of the Greek Asklepieia as had previously been excavated, especially in the case of Epidaurus. He went on to describe the

HEALTH TEMPLE OF COS.

The great Health Temple of Cos was situated two miles from the sea, at an elevation of about 320 ft., at a point where the range of mountains which rises on the south coast of Cos to a height of about 2,800 ft. springs from the gentle slopes of the plain.

Earthquakes, with disturbance of the soil, the growth of vegetation, the evil deeds of the lime-burner, together

Of course, little remains of the sacred precinct but foundations, but from these and the architectural fragments which remain it is not difficult to reconstruct in one's mind the *ensemble* of beautiful buildings which existed 2,000 years ago.

The accompanying picture (Fig. 1) of a mental restoration of the temple will give some idea of the buildings, which stood in three step-like terraces.

In the foreground is seen a three-sided stoa or portico, having irregular buildings at a lower level adjacent to its outer border all round. This stoa is approached by a Doric propylaea or porch. Within this porch there are signs of certain great tanks or basins, and of an aqueduct supplying them. They were probably for the preliminary ceremonial ablutions. The Asklepiadae were to be congratulated upon this usage. (Many of their successors would not be sorry if a preliminary cleansing or libation

of soap and water were required from some of the votaries of the out-patient room in our modern Asklepieia ! The buildings adjacent to the left wing of this great stoa were occupied by an extensive series of baths, mostly reconstructed in Roman times. Here the hot and cold douches of which Hippocrates speaks, the frictions, and affusions of water of various temperatures, the inunction of "smegma," a sort of hot semi-fluid soap, the massage, and the applications of sponge and strigil took place. Hippocrates believed greatly in the remedial uses of water, and here, doubtless, hundreds of his patients have submitted to the hydrotherapia of the time. Probably the remainder of these rooms in the north and west of the Stoa served as waiting rooms, consulting and operating rooms, the Iatrium, with its store of instruments of which Hippocrates speaks, including the Scamnum, or bench for reducing dislocations. Here, probably, would be the

know that Hippocrates was the pupil of his father, Heracleides, the physician, but also of Herodicus, who relied more upon exercise and gymnastics than upon any other treatment. Hippocrates tells us that he believes Herodicus killed some of his patients who had febrile or acute diseases by insisting on too violent exercise. While avoiding this error Hippocrates prescribed exercise largely in suitable cases. Could we transport ourselves backwards in time to the year 400 before Christ we might have seen in this palaestra the gouty man casting the discus, walking or running round and round the stoa, or going through the sword or spear exercise, grumbling meanwhile at the meagre diet prescribed him, while the weakly and ill-developed youth beside him ran, threw the javelin, or engaged in gentle wrestling, drank the "red water," and took a full and nutrient dietary.

Within the portico were many inscribed wall slabs,

Fig. 2.—Temple of Apollo, with stone coffer.

dispensary, where were prepared the tisanes, the hellebore, the arsenic, the cantharides, and other drugs he names, also the library. Here may have been the rooms devoted to teaching, for Cos was a most important medical school. Here, probably, Hippocrates wrote his careful notes of cases, and kept the skeleton which he afterwards gave to the oracle of Delphi.

Here, also, may have been the culinary department where the special diet to which the Coan School gave so much attention was prepared, where probably the "cygeon" was made, that curious mixture of cheese, honey, and wine, which we first read of as being given by Circe to Ulysses, but which, notwithstanding this very dubious precedent, may have proved a nourishing form of food for certain of the sick. Here, perhaps, was the winestore for the Chian or the strong Cretan vintages which Hippocrates so rarely gave undiluted. He was a believer in the truth that much strong wine weakened rather than invigorated. At the south-west corner of the stoa were situated the sanitary arrangements of the precinct. The area enclosed by the stoa was probably a palaestra, where the gymnastic part of the treatment was carried out. We

some referring to the inviolability of the precinct, others bearing wise maxims in regard to health.

If Dr. Ermerins is correct, many of these existed prior to the time of Hippocrates, and were quoted in his *Prorrhetics* and *Praenotiones*. Probably in later times many of his wise admonitions were added to the number. We know that at the neighbouring Asklepieion of Cnidus similar precepts, termed the "Cnidian sentences," written by the physician Euryphon, were in like manner exposed to view. The records of honours gained by Coan physicians were also conspicuous here.

The south side of the quadrangle consisted of a lofty wall with buttresses supporting the second terrace. This wall was interrupted by a flight of steps leading up to the second terrace, and by several drinking fountains, one in particular, the sacred spring, of which no doubt every patient was made to drink freely.

Ascending the stairs to the middle terrace, we find ourselves in the most ancient part of the precinct, where the various buildings were arranged with much irregularity. Near the centre of the terrace stands the great altar, a structure measuring 12 metres by 8, approached

by steps on its western side. In some respects it reminds the visitor of the great altar of Pergamon, though smaller. It is difficult to judge from the remains what the exact details of construction were, but it appears to have been surrounded by a colonnade.

COS AND ALEXANDRIA.

There was a close association between Cos and Alexandria, and I confess to the hope that a shrine of Iemhotep, the Egyptian god of medicine, would have been found here (as there is reason to believe it has at Epidaurus), but none has as yet been discovered. Another link, however, connects this altar with Alexandria. Herondas, the Alexandrian poet of the third century B.C., wrote eight "mime-iambics," comic dramatic poems, the scenes of which are all laid at Cos. The action of the fourth of these takes place in front of this altar. Two peasant women desire to offer a cock to Asklepios. During the sacrifice they chat with the pyrophorus or sacrastan, who shows much enthusiasm on the subject of fees, and they comment on certain works of art, a sacrificial procession by Apelles, and a figure of a small boy struggling with a goose, which are placed near the altar.

Quantities of terra-cotta lamps and figurines were found round the altar.

A TEMPLE OF APOLLO.

To the west of the altar stands an Ionic prostyle temple, 16 metres in length and 8 metres in breadth. Its dedication is unknown. But there is evidence from inscriptions that a temple of Apollo formerly existed here. Apollo being one of the greater gods would naturally have his temple facing the east, and this temple is the only one in the whole precinct which has this orientation.

The worship of Apollo, which it is thought took place here, was probably superseded by that of Asklepios in later times. So this may have become the Asklepiian shrine until the date when the great temple was erected on the upper terrace. It contains one curious feature—a large stone cyst or coffer composed of massive marble blocks forms a portion of the floor of the naos; it is about 5 ft. long by 4 ft. wide, and is about 3 ft. deep. The side blocks were connected by strong metal clamps. The weighty block forming the lid is pierced in its centre by an aperture some 6 in. broad (Fig. 2). Dr. Herzog thinks it is a Thesaurus, or treasury. But the difficulty of removing the massive cover—which has no rings or handles for such a purpose—would almost render it impossible to deposit or remove such treasure.

THE SACRED SERPENTS.

It is known that at every Asklepieion the sacred serpents were worshipped as the incarnation of the god. They were tame and harmless, and were free to wander at will throughout the precinct. They probably were

supplied with a den or hiding place to which they could retire, and it would obviously be convenient if this den were adjacent to the small altar where sacrifices were offered to them, and where they were fed with the sacrificial cakes or "popana" by their votaries. At Epidaurus a curious dark labyrinthine vault was provided beneath the Thymele or sacrificing place. This I believe to have been the Ophision or serpent house, from which the serpents emerged close to the altar when the sick came to sacrifice and to feed them. We know from a reference in the *Plutus* of Aristophanes that the serpents were accustomed to be summoned by the sound of a whistle. A somewhat similar structure on a smaller scale exists at the Athens Asklepieion. There are, however, other theories as to the explanation of these buildings, but none can be said as yet to be proven. To me the above explanation seems the most probable. I think it likely that this temple at Cos, after ceasing to be the special shrine of Asklepios, continued to be the Thymele or sacrificing place for the sacred serpents, and this coffer in the floor was the Ophision or snake house.

Above or near it would stand a stone or bronze altar on which the incense and other bloodless sacrifices would be offered. Hither the sick would come, accompanied by a priest, to offer their sacrifice and feed the serpents with popana or sacrificial cakes. The accompanying sketch (Fig. 3) shows the roof of the coffer and what I conceive to have been its use.

OTHER BUILDINGS.

To the north of this temple stood a building divided into rooms, reconstructed in Roman times, which is thought to have been a house for the priests.

Passing now to the east of the great altar we come to a

Fig. 3.—Ophision or snake-house.

Doric peripteral temple, the most ancient in the precinct. It measures 16 metres in length by 10 in breadth, has six columns at each end and nine on either side. It faces west. It is known that there were shrines of Hygieia, Aphrodite, Helios, Athena, the Fates, and Hemera in the precinct, perhaps it was dedicated to one of these. To the north of this temple, adjacent to the great flight of steps, a lofty supporting wall was built against the face of the cliff. Between it and the peripteral temple is a large exedra or semicircular seat, where doubtless the convalescents sat to enjoy the glorious view and the sweet sea and mountain breezes. On the east of the peripteral temple there remain a series of irregular foundations, on which stood probably small temples and shelter porches, the latter of which would serve the same purpose as the exedra. No colonnades are found on this second terrace.

Ascending the great flight of steps and passing on the way a large base which may have supported a colossal statue, we reach the highest terrace and find facing us the great temple of Asklepios. This is a newer building,

dating from the latter years of the third or beginning of the second century before Christ. It is peripteral Doric, and measures 31 metres by 16. Six columns stand at each end, and eleven on either side. The foundations are chiefly trachite, but the temple and columns were marble. Each column was 1½ metres in diameter at the base. There remain traces of two groups of statuary. After the fall of the temple, probably in the earthquake of 554 A.D., a Byzantine chapel was constructed in the remains of the pronaos.

INTERIOR OF THE TEMPLE.

Little is known about the interior of the temple. A great figure of Asklepios would stand in the naos, but it is not known what was its material. Some remains of a great marble serpent have been discovered. Great porticos surrounded the temple on the east, south, and west, the whole structure measuring about 108 metres east and west and 70 north and south. It seems probable that the east and west wings of the stoa were abaton or sleeping places for the sick, like those at Epidaurus, the one for male the other for female patients. Here they reposed on their couches for the night (and some also during the day), hoping for illuminating nocturnal visions from the god, for visits from the sacred serpents, and for miraculous healing. Here the evening prayers were recited to the gods, to whom gifts were presented on the tables and altars within the abaton, and all the occupants were encouraged by the priest to hope for succour from Asklepios and Hygieia. The abaton was a lofty colonnade freely open to the mountain breezes, and much resembled the shelter balconies used in our modern sanatoriums. The mere exposure to a pure atmosphere was then, as now, a most potent health giver. It is interesting to note that the idea of incubation close to a temple or church as a means of cure for the sick still exists at Tenos and other of the Greek islands (vide the writings of Dr. Rouse).

The sacred grove of cypresses surrounded the upper and middle terraces.

SPRINGS.

Higher up in the hills were two remarkable springs. One known as the Fountain of Hippocrates may be approached by a short tunnel of Mycenaean architecture, at the end of which is a curious dome-like chamber with seats round its walls and a fountain in the centre. The second is the celebrated "Red Water" or chalybeate spring, no doubt used in cases of anaemia. Convalescents were encouraged to mount the hill and drink from one or other of these springs at its source. It is not yet decided whether any of the numerous lines of earthenware piping discovered near the Asklepieion conveyed these waters down to the various fountains and baths in the precinct.

WORKS OF ART.

Multitudes of works of art existed here in ancient times, but all have been stolen or destroyed. A celebrated statue of Alexander the Great, of bronze, is recorded to have had rather rough hair on the head, in the interstices of which there grew a seedling lily. Many small fragments of statuary of great merit have been discovered, and vast numbers of remains of inscriptions, into the details of which limitation of space prevents my entering. No theatre or stadium existed at the Asklepieion, those adjacent to the town of Cos being employed at the time of the great festivals.

The research thus far has proved extremely interesting, and Dr. Herzog is to be congratulated on his learning and success as an excavator.

HEALTH MEASURES IN BRAZIL.—According to the items of the Brazilian Budget approved by Congress for the year just commenced, Brazil seems to be spending considerable sums of money on sanitary and medical objects. The Ministry of Justice and Home Affairs is authorized to expend 500,000 milreis on the purchase of disinfecting apparatus and barges for use in ports, more especially at Pernambuco, Maranhao, Alagoas, and Parana, but it is not stated whether the Clayton apparatus is to be employed. For the Naval Hospital at Rio the Ministry of Marine is to engage a thoroughly experienced oculist at an annual salary of 6,000 milreis for a period of not less than three years, and 20,000 milreis are allocated for the purchase of the latest surgical instruments for the same institution. A loan is also to be issued for the object of providing Rio de Janeiro with an improved supply of drinking water.

SCHOOL HYGIENE.

STOCKPORT.

DR. MEREDITH YOUNG, M.O.H. for Stockport, has presented to the Education Committee of that county borough a report on a special examination of school children.

It comprises an account of 142 children medically examined by him because they were reported, from the schools and from other sources, as being below the mental standard of other children of corresponding age.

The Education Committee had been anxious for some time to adopt a form of special education for mentally defective children incapable of receiving benefit from the teaching in ordinary schools. In order to ascertain the number of such children, they issued a printed inquiry form to the school teachers, but when these came in they found that physical and mental defects were hopelessly confused; and further, that the various degrees of mental abnormality were most imperfectly distinguished. They therefore asked Dr. Meredith Young to visit the whole of the schools in the town, and examine all the children reported from these schools by the teachers. The results of the medical examination made by Dr. Meredith Young are embodied in the report. All his recommendations were adopted, and a special vote of thanks accorded to him for the work he had done.

CLASSIFICATION.

The chief difficulty lay in the proper classification. We quote from Dr. Meredith Young's report: The dividing line between the various degrees of mental abnormality cannot always be drawn with precision. Overlapping frequently occurs, and "borderland" cases are common. In their ordinary surroundings the brain of children plods along in its usual subnormal style, but when a stranger comes with perhaps unusual questions to propound and with methods of examination which excite their temporary curiosity their brain is momentarily stimulated, and unless careful discount be applied their actions and words may lead to their being wrongly classed in an exalted standard.

The term *idiocy* is used in this country to indicate the lower grades of certifiable mental deficiency, and *imbecility* the higher grades. But more recently a class of children has been isolated who, whilst not being imbecile, far less idiots, exhibit a degree of mental defect which prevents their deriving reasonable benefit from the ordinary school curriculum, and who, therefore, require special modes of instruction. Such children have usually been classed as *feeble-minded*. These, again, are only removed by a narrow dividing line from children who, on account of inherited conditions, poor nutrition, etc., are merely *dull or backward*, and who are probably in a standard or class below that which the average child of the same age has attained. We thus get four stages or shades of mental imperfection:

1. Idiocy. (Lowest grade.)
2. Imbecility.
3. Feeble-mindedness.
4. Mental dullness. (Highest grade.)

OBJECTS AND METHODS OF EXAMINATION.

The examination was complicated slightly by the fact that of the children submitted, some were physically defective only—deaf, short-sighted, deformed, etc.—whilst the remainder exhibited various degrees of mental abnormality. Occasionally both physical and mental defects co-existed, and the problem became that of carefully balancing the two and prescribing treatment accordingly. Hence my first determination had to be the division of the children examined into:

- A. Mentally defective;
- B. Physically defective only, and dull or backward on account of such defects.

Having done this, the mentally defective had to be most carefully subdivided into:

- (a) Those capable of being taught in ordinary schools;
- (b) Those incapable of being taught in ordinary schools, but capable of receiving benefit from instruction in special classes;
- (c) Those incapable of instruction in either ordinary schools or special classes.

The classification thus arrived at may have to be revised more than once; it may prove that all attempts to regulate the brain processes in a child recommended for