THE HEALTH CONGRESS AT GLASGOW.

AT the congress of the Sanitary Institute recently held at Glasgow, a large number of sanitary officials, delegates from sanitary authorities, and others interested in public health matters assembled, and a busy four days of discussions were relieved by a generous programme of local entertainments. Glasgow is an excellent centre for such a meeting. The hospitality of the city is proverbial, and the enlightened enterprise of the corporation and its officials in dealing with the sanitary needs of "The Second City in the Empire" is generally recognised. The city abounds in interest to those who appreciate what a far-sighted and energetic civic management of affairs has achieved in the direction of solving the many public health problems which present themselves in every large industrial community. An enlightened municipality has provided an excellent system of electric trams, and acquired its own water supply and lighting; four public abattoirs have been established, and private slaughter-houses abolished; and hospital accommodation amounting to $1\frac{1}{2}$ beds to every 1000 of the population has been provided for the infectious sick. But the energy and wisdom which have characterised the civic management of affairs is in no respect better evidenced than by the circumstance that in comparatively recent years no fewer than fifteen parks or open spaces, together amounting to more than 1000 acres in area, have been procured as lungs for the city. There is, indeed, no form of municipal enterprise in the interest of public health, however recent or advanced, which has not been adopted and put to the test in Glasgow; and hence the attractiveness of the city to the hygienist and to the earnest municipal representative. Model lodgings for the poor and labourers' dwellings now replace some of the insanitary property which has been demolished; the corporation owns a municipal infants' milk depot, reception houses for the temporary detention of those who have been in close contact with certain of the infectious diseases, municipal chemical and bacteriological laboratories, public baths and wash-houses, and it has recently had the courage to demand the closing of the public houses at 10 p.m. Drunkenness is very prevalent in Glasgow, and the more drunkenness can be reduced the easier does the solution become of most public health problems.

Despite all this good work, the conditions under which so many of the poor are still housed in Glasgow continue to demand the exercise of much energy and enterprise on the part of the local authority. A tremendous amount of "spade-work" still remains to be done, and it is not easy to contemplate the state of things which would now exist if the corporation had shown less wisdom and vigour in dealing with the poorer section of the community in the past, for few, if any, cities of Great Britain have stood more in need of enlightened administration. Glasgow is essentially a manufacturing and trading community. A city cannot be this and beautiful at the same time. It has an atmosphere in which poverty, dirt, and intemperance naturally take root and thrive. But the corporation has proved itself to be quite wide awake to the wants of Glasgow, and it is administering to those wants with no niggard hand. Would that it could deal effectively with those pernicious individuals who fatten on the poorest section of the community by the system of "farming" tenements, and would that it could succeed in abolishing that almost essentially Scotch custom of placing beds in air-stagnant recesses in the walls of living rooms, for it is not easy to exaggerate the harmful effect the custom must have upon the public health.

It is, of course, impossible within the limits of a short article to deal adequately with the extensive programme of work performed at the congress. Figuring most prominently among the more important subjects which came under discussion were those of the milk supply, the disposal of sewage, the housing of the poor, infant feeding, school hygiene, the hospital isolation of infectious disease, and disinfection.

Dissatisfaction was generally expressed at the lack of suitable precautions to guard our milk supply from contamination, and there was a general conviction that this circumstance was responsible for much preventable infantile mortality. The same unanimity was not accorded to the subject of the value of hospital isolation of scarlet fever patients, and this was responsible for a lengthy discussion at the conference of medical officers of health. There is a considerable body of expert opinion opposed to the present wholesale and indiscriminate hospital isolation of this disease, which now generally assumes so mild a type. Hospital isolation seems incapable of materially reducing the attack rate among the community, and so few children escape attack altogether that the good obtained is disproportionate to the enormous expense entailed, and therefore the restriction of the number of cases admitted to hospital to those who cannot possibly be nursed at home without great risks, is advocated by many. This restriction, strictly enforced, would reduce the number of admissions by some 50 per cent. in many large towns, and the money thus saved could be spent with far greater effect upon other public health measures.

Many of the papers contributed to the congress dealt with controversial subjects, and contained nothing of scientific value; these contributions, however, serve a most useful purpose at such meetings, for the adoption or otherwise of administrative measures of public health importance is largely determined by the trend of the general discussions which they evoke.

Reference may be made to one or two of the more practical papers which were of general interest.

In a paper read by Dr. R. H. Crowley upon the spread of diphtheria in schools, it was pointed out with reference to a school outbreak of this disease in Bradford that whereas the throats of ninety-three scholars gave no clinical evidence of diphtheria, in forty-two instances diphtheria bacilli were present; and the importance of such an examination and the necessity of isolating scholars who, though apparently healthy, contain the germ on their throats during such outbreaks were emphasised.

Dr. Louis Cobbett, in another paper, concludes from the result of his experience in the Chelmsford and Cambridge outbreaks of the disease that diphtheria bacilli in healthy persons are only to be found among such as have come into contact with cases of diphtheria, and possibly also in those who have come into contact with healthy people who harbour the bacilli, and he advocates that all sanitary authorities should have at their disposal the services of a skilled bacteriologist.

Dr. A. Greenwood brought before the notice of the congress the results of his examination of the air of certain school class-rooms in Blackburn. He found that the average amount of carbon dioxide (CO_2) present in the air of Blackburn was 4·37 per 10,000, whereas that of the air of Blackburn schools was 9·69. This amount of vitiation of the air in the class-rooms of schools is doubtless very general, and improved means of ventilation are demanded in the interest of scholars.

Dr. H. Wright Thompson gave the results of his examination of the eyes of 750 Glasgow school children. He found that 34·2 per cent. of the 600 Christian children were in need of medical ophthalmic treatment, and that 47·6 per cent. of the 150 Jewish children required such treatment. So far as eyesight is concerned, Glasgow children are in a worse condition than those in either Edinburgh or Aberdeen.

Mr. W. C. Tyndale and Lieut.-Colonel Davies, R.A.M.C., in a paper recording valuable experimental work (including suitable bacteriological experiments), conclude that when the surface of a chalk formation is deluged with sewage, traces of sewage, as evidenced bacteriologically, may penetrate to a considerable depth, but that when sewage is applied in an ordinary and reasonable way over the surface no such contamination of the subsoil takes place.

Prof. Kenwood and Dr. Allan, in dealing with practical disinfection, furnished the results of experiments upon the disinfecting action of certain disinfectants after being exposed for four weeks to the air. The results show a considerable loss of power in most instances, even in the case of carbolic acid.

A rather sensational paper was read by the chief sanitary inspector for Glasgow, Mr. Peter Fyfe, upon the result of the examination of certain flock material taken from mattresses. This material is sometimes made from rags and cast-off clothing sorted from ash-pits, &c., and the bacteriological examination of the flock taken from some recently purchased mattresses disclosed an amount of un-

cleanliness in the form of live potential dirt that is unpleasant to contemplate, and is not without its dangers. The results of the examination revealed a state of affairs which calls for remedial action.

The usual exhibition of sanitary apparatus and appliances was held in association with the congress, and a new feature, which certainly met with an encouraging amount of success, was the delivery, each evening, of free popular lectures upon different items of general hygiene.

INDIAN IRRIGATION AND ITS RELATION TO FAMINES.

IN the summer of 1901 the Governor-General of India in Council decided on the formation of a special commission to report on the irrigation of India as a protection against famine.[1]

The commissioners appointed were Sir T. Higham, M.I.C.E., Inspector-General of Irrigation; the Hon. Denzil C. J. Ibbetson, Chief Commissioner of the Central Provinces; the Hon. J. W. P. Muir Mackenzie, Secretary to the Government of Bombay; Diwan Bahadur Mudaliar, member of the Legislative Council of Madras; with Sir Colin Scott Moncrieff as president, and Mr. W. B. Gordon, M.I.C.E., as secretary. Their first meeting was held at Lahore on October 29, 1901. Two years were spent in inspecting all the principal irrigation works, and their report was presented to Parliament a short time ago in the form of a Blue-book.

About the same time the Department of the Interior United States Geological Survey sent Mr. Herbert M. Wilson, one of their staff, to India to investigate the method of irrigation as carried out there, and to obtain such information as might be of use to the department charged with the irrigation works in the western States and the reclamation service of the American Geological Survey.

His report, entitled "Irrigation in India,"[2] was published in 1903. Largely as the result of the renewed activity in irrigation in America, the first edition of the report was soon exhausted, and a second edition revised up to date has been issued.

India stands preeminent in the gigantic engineering undertakings carried out for irrigation purposes. No other country has so vast and so fertile an expanse of territory with such convenient slopes for the construction of canals, and at the same time such an abundant though varied water supply.

The main factors determining the use and value of irrigation are the rainfall, the character of the soil, and the class of crop best suited to the special conditions prevailing.

In India the zone of heaviest rainfall lies along the western coast of the main peninsula, where the monsoon striking the western Ghats precipitates on their outer slopes an average annual rainfall of 100 to 250 inches. On the outer ranges of the Himalayas the annual rainfall amounts to 461 inches. Over the greater part of India, however, the rainfall is below 40 inches. In the extreme south of the peninsula it is scanty and precarious, and in some of the States of the north-west the average annual fall is as low as 5 inches. Where the annual rainfall is below from 10 to 12 inches cultivation is practically impossible without irrigation. Where it is abundant and exceeds 70 inches the chance of the failure of the crops may be regarded as so remote as to make irrigation unnecessary. Between these two extremes lies a vast tract of nearly a million square miles of which, in the absence of irrigation, no part can be deemed absolutely secure against the uncertainties of the season and the scourge of famine.

On the irrigated lands two crops can be taken in the year, one of which is sown in the early spring and gathered in the autumn, and the other sown in the autumn and gathered in the spring. The summer crop depends little on irrigation for its maturing, as this is growing during the monsoon or rainy season. The autumn crop consists of millet, pulses and rice, and the spring crop of wheat, barley, linseed and grain. The crops mainly dependent on irrigation to ensure a full return are wheat, barley, sugar cane, garden crops, and cotton where it grows on the black soil. The area under wheat covers more than 16 million acres, and that on which cotton is grown $8\frac{1}{8}$ million acres. Rice is an extensively cultivated crop, but is principally limited to the delta lands of the Orissa, Godaveri and Bengal; 80 per cent. of the crops raised in such regions are rice. Millet and oil seeds also are important crops. All kinds of vegetables and fruit are produced, these being the chief food of the natives. Jute is very extensively grown, the largest imports to this country coming from India. Indigo is also largely grown by the natives, and poppies for the production of opium. Tobacco and coffee are only grown in small quantities. Tea is extensively grown in Assam, where it is indigenous, and also in Darjeeling.

Irrigation has been practised in India from time immemorial. Many of the large tanks or storage reservoirs date back to the eighth and ninth centuries. The Grand Anicut in Madras is supposed to have been made in the second century. A canal on the banks of the Jumna made by the former rulers was restored in 1814, and the experience gained in this work led to the construction of the great Ganges Canal, a work which in magnitude and boldness has not been surpassed by any irrigation work.

The total length of the Government irrigation canals, including branches, is 36,000 miles, and they can discharge more than 100,000 cubic feet of water a second, and irrigate annually 19 million acres. There are also 7000 miles of minor protection works and storage reservoirs with a capacity of 25,000 million cubic feet.

The total area in India irrigated is estimated at 44 million acres, of which 42 per cent. is supplied with water from State works, $15\frac{1}{2}$ millions being from canals, and 3 millions from reservoirs. Of the private works, covering $25\frac{1}{2}$ million acres, 2·8 per cent. is from canals, 11·8 from tanks, 29·2 from wells, and 14 from other sources.

The capital outlay on the thirty-nine canals and major works up to the end of 1901 was more than $36\frac{1}{2}$ millions of pounds (counting a lakh of rupees as equal to 10,000*l.*). The annual revenue after paying all working expenses was 7·1 per cent. The works in the Punjab yield a net revenue of $10\frac{1}{2}$ per cent.; those in Bombay and Bengal do not earn enough revenue to cover interest charges on capital outlay.

The value of the crops irrigated in a single year is about equal to the whole capital cost of the works, and in time of famine the produce of the irrigated area being largely available for transport to distressed districts becomes an important item in the general food supply of the country. The irrigation works have also been largely instrumental in relieving congested districts. Some of the great canals in the North-West Provinces and the Punjab were undertaken in districts that were sparsely inhabited; within ten years from their construction the country became fully populated.

With regard to the value of irrigation works in mitigating the horrors and cost of famines, in the Sholapur district, where four famines have occurred since 1846, and where the cost to the State of the last two famines in 1896 and 1899 was equal to 1,150,000*l.*, the estimated loss is reckoned at 50,000*l.* a year, which, capitalised at 4 per cent., amounts to $1\frac{1}{4}$ millions of pounds as the limit of unproductive expenditure that might be incurred for the sake of avoiding the future cost of famine relief for this district alone. During the terrible famine of 1876, for which a large relief fund was raised in this country, $5\frac{1}{2}$ million of lives were lost, although the Indian Government expended 11 millions of pounds in relief.

Many of the great works already undertaken have been the direct outcome of famines. The great famine of 1837 in Bengal led to the project of the Ganges Canal, which has now 5500 miles of main canal and branches; the famine which desolated Orissa and the north of India in 1864, when a million of the inhabitants lost their lives by starvation, notwithstanding the expenditure of upwards of $6\frac{1}{4}$ millions of pounds in combating the famine, and also more than 3 millions in works of irrigation, resulted in the policy since adopted of systematically carrying out extraordinary public works and expending half a million a year in developing

[1] Report of the Indian Irrigation Commission, 1901–3. Part i. General. (Eyre and Spottiswoode). Price 1*s.* 4*d.*

[2] "Irrigation in India." By Herbert M. Wilson. (Washington: Government Printing Office.)