Current Literature.


Following the publication of Crowden's work in the *Journal of the Royal Army Medical Corps*, Lieutenant-Commander Douglas and the author co-operated in pursuing similar investigations in the climate of Singapore.

The clothing chosen for the tests was: (1) An ordinary gas-protective suit with hood and respirator; (2) a suit of wettable double cellular cotton with a hood of the same material and respirator worn over the gas-protective clothing; (3) a suit of white surgical lint with a hood of the same material and respirator worn over gas-protective clothing. The work undertaken was exactly as described by Crowden. The subjects were average members of a fighting Service personnel.

The best results were obtained with a subject wearing No. 3 clothing; the man worked continuously for twenty-five minutes and showed no signs of fatigue; in a second test the man performed an hour's work with three stoppages amounting to twenty-seven minutes. The author repeated Crowden's experiments and worked for twenty-five minutes without being seriously tired. He concluded that continual wetting of an ordinary gas-protective suit during muscular efforts enables work to be performed, diminishes discomfort and lessens the danger of heat exhaustion. Indeed, the standard and persistence of the work displayed by subjects who wore no external water-retaining layer scarcely fell below that shown by other workers who wore water-retaining material. He considers that the ordinary gas-protective suit can be made practicable for use in the climate of Singapore, provided it is kept continually wet during use. Wetted cellular cotton and surgical lint materials have some value as cooling agents when worn over protective clothing, but probably have no advantage over the wettable and water-retaining fabric adherent to the gas-impermeable layer as described by Crowden. Cotton and lint clothing increase the time of dressing, and undressing, and would be apt to perish and shrink after boiling.


In 1931 Shope showed that two agents were necessary for the development of swine influenza, viz., *Haemophilus influenzae suis* and the swine influenza virus. Pig disease spreads rapidly by contact during the winter but disappears in summer: at this period the virus has not been detected in the herds. Shope has now shown that in the inter-epidemic periods the virus may persist in lung-worms of which two species infect pigs—
**Current Literature**

*Metastrongylus elongatus* and *Ochrostrongylus pudendotectus*. The worms inhabit the bronchioles at the base of the pigs' lungs and embryonated ova are passed in the faeces, and are ingested by earth-worms in which they develop; after weeks on grass the earth-worms may be eaten by pigs and the liberated lung-worms then find their way into the pig's respiratory tracts. Shope showed that influenza—proved genuine by recovery of the virus—could be induced by intramuscular injections of *H. influenzae suis* into pigs previously fed with infected earth-worms. The first infection of bacteria did not cause the disease; the pig had to be sensitized to the microbe, when subsequent injection gave rise to the results required. Injection of the hemophylus into pigs not fed on infected earth-worms never produced the disease; nor did this follow the ingestion of the infected worms without the provocative injection of bacteria. The role of *Hemophylus suis* is probably not specific, since Shope has produced influenza by a single intrapleural injection of calcium chloride into suitably prepared pigs.

Proof that a virus can be carried by an intermediate helminth would be of great importance to the epidemiologist and no doubt Shope's experiments will be repeated. Unfortunately he has been unable to demonstrate virus in presumably infected earth-worms or in the lung-worms of swine thought to be ripe for provocation.

These results with swine influenza may well prove important for epidemiological studies in America and may give a clue to the distribution of the disease in other countries. They make us speculate once more where human influenza virus persists in inter-epidemic times. Our knowledge of human helminths does not render it very probable that the results will be applicable to disease in man.


Swimming bath water was examined by the coliform test, 339 samples from chlorinated and 47 from non-chlorinated baths in Manchester. A number of experiments were made to test the effect of chlorine on certain types of the coliform group.

The open-air pools are not treated, but submitted to periodic scrubbings with chloride of lime. The indoor bath water is filtered and chlorinated on lines drawn up in the Purification of Water of Swimming Baths. (Ministry of Health, 1929.)

The presumptive coliform test gave positive results in 160 of the chlorinated and 30 of the non-chlorinated samples, but the number of tubes positive is not clearly specified for all samples.

Further examination of the presumptive positive samples revealed that *Bact. coli* was isolated almost as often from chlorinated as from non-chlorinated bath samples (over 70 per cent), but intermediates and *Bact. aerogenes* were more frequently found in chlorinated samples, particularly the latter,
which occurred in 70 per cent of chlorinated compared with 43 per cent of non-chlorinated samples.

Despite the fact that 89 per cent of the 2,400 coliform strains isolated were from the chlorinated series of presumptives, intermediates and aerogenes were again shown to be more common in chlorinated pools.

It is impossible to preclude the chance of soil origin of intermediate-aerogenes-cloacae (I.A.C.) organisms in the open-air waters, but there is little doubt that these types in the indoor pools come from human contamination.

A series of experiments was carried out by the author on the chlorination of suspensions of pure cultures of coliform organisms in distilled water. The initial concentration of bacteria was enormous, far in excess of the coliform content found in the bath samples. After mixing, the chlorinated suspensions were kept at 22° C. (approximately the temperature of the swimming bath water) for several days, and bacterial counts made from time to time. A dose of 0·1 part per million had little effect, but 0·3 and 0·5 part per million caused a rapid reduction of organisms, counts of coli, intermediates, and aerogenes falling steadily for forty-eight hours, until all trace of chlorine had disappeared. A gradual rise in count followed but did not continue indefinitely, and never reached the numbers in the original inoculum. Bact. aerogenes required four to six days to reach its maximum, which was one-ninth of the initial content; intermediates required seven to nine days to reach a maximum of one-thirtieth of the original; and Bact. coli required twelve to fifteen days to reach one-hundredth of the original.

The author quotes the results of several workers, showing the importance of intermediates and aerogenes as intestinal congeners, and so explains their presence in swimming bath water. The chlorine experiments did not reveal any marked difference in sensitivity of coliform types (except that the recovery time and number were greatest with Bact. aerogenes), and so did not explain the greater frequency of I.A.C. in chlorinated pools.

It is suggested, owing to the practical difficulties of chlorination, that portions of the bath are but feebly disinfected and in these areas the difference in sensitivity between the coliforms will have an effect. This difference, however, is so slight that aerogenes rarely becomes dominant, but shows as an increase in proportion of aerogenes survivors to coli survivors in chlorinated compared with non-chlorinated swimming baths.

E. Windle Taylor.


A number of experiments are reviewed, showing the nutritive value of egg in the diet. Rats on a diet of 70 per cent dried bread and 30 per cent whole egg powder showed excellent growth and health and reproduction, similar to those of animals on 30 per cent dried milk. When lean beef was
given *ad libitum*, instead of egg, there was initial good growth followed by loss of weight, bad health, and early death. Rats fed on diets resembling those of nursery-school children containing various amounts of white cereal, milk, vegetables and fruits, fats, sugars and meats, showed good growth but failure of lactation. On the medium cereal diet, part of the meat and fat were replaced by the equivalent of one egg a day in a child’s diet (about 3 per cent total calories). This resulted in better gains in weight, improved lactation, and earlier maturity (average age at first litter without egg being 105 days, with egg 94 days). These experiments showed that a diet already good for growth could be improved more by substitution of egg for meat than by an increase in vegetables. Sixty children were kept on a diet in which 36 per cent of the calories came from milk, 30 per cent from cereals, and 20 per cent from vegetables and fruit. They were divided into two groups, one receiving an egg daily (increasing the iron intake by 10 per cent), the other its equivalent in calories in the other foods. At four-month intervals, blood tests showed 40 per cent of the children receiving egg to have a haemoglobin value of 12·5 grammes per 100 cubic centimetres of blood, while only 22 per cent of the children not receiving egg reached this level. The difference in haemoglobin content was more marked in the second than in the first year of feeding. Similar results were obtained when liver was used instead of egg, although in anaemic rats twice as much iron in the form of liver was needed to induce a given amount of haemoglobin regeneration as when Fe was given in the form of egg.

A discussion of the protein value of egg is given. As the sole source of protein, its biological value is given as 93. Wheat which is short of lysine becomes fully efficient when supplemented by egg, milk, or meat. Egg-yolk is readily digested, but various experiments show the difficulty in digesting raw egg-white. A coagulation of the albumins by heat greatly increases the ease of digestion of egg-white. From a mineral point of view egg is chiefly significant for its iron in the yolk. No other animal tissue approaches egg-yolk as a source of vitamin A except liver, which is more than twice as rich weight for weight in A-content as egg. The A-content of the egg can be increased by adding the vitamin to the diet of the hen. Hens having access to a blue grass range gave eggs with five times the A potency of eggs from hens on the same basal diet having no access to green food. Cod-liver oil also increases the A content of the egg. Storage of eggs causes no appreciable loss in A content. Eggs provide about 15–20 units of B₉ (present almost entirely in the yolk), and are equal to wheat-germ as a source of B₂. Egg-yolk is next to fish-oils as a source of D. No other natural foods furnish more than very small amounts. Both the B₂ and the D content of eggs can be increased by suitable feeding of the hens. Eggs contain some of the pellagra-preventing factor—nicotinic acid—and also B₆.

Some infants are sensitive to egg-white, developing allergic reactions to it. Because of this, and because the white is almost devoid of Ca, P, and Fe, yolk is often best used alone in infant feeding. The combination of egg
Reviews

(rich in Fe) and milk (poor in Fe) is valuable. Dietary surveys in America showed that about 5.5 per cent of the total food expenditure was for eggs, about 32.2 per cent for meat and fish. Nutritionally, it would be more economical to spend more on eggs and less on meat, as the calories and protein returns are about the same but the eggs for a given expenditure provide much more Ca, P, Fe, and vitamins A and B1, than the meat.

DOUGLAS C. HARRISON.


The result of the tests carried out are given in graphs in the article and the conclusions arrived at were:

(1) That vitamins A and D are present in similar amounts in all three types of cheese examined and no difference could be detected in this respect between the pasteurized and non-pasteurized; in other words, pasteurization did not diminish the content of these vitamins.

(2) Vitamin B1 was present in small quantity in all, a little less in the pasteurized but the difference was so small as to be negligible.

(3) Vitamin C is absent from hard seasoned cheese, and the amount in fresh cheese is small, practically negligible.

(4) Finally, judging from the author's investigations, pasteurization does not reduce to any appreciable degree the vitamin value of cheese.

H. H. S.


Reviews.


The twelfth edition of this well-known book is published for the first time under the name of the original author in collaboration with Dr. F. D. Adams. The volume has become considerably enlarged by over 200 pages and by some 70 illustrations, and in the subject matter there have been many deletions and substitutions which have, in the reviewer's opinion, greatly enhanced the value of an already important work. These changes have become necessary because, as the authors explain in the preface, the basis of the subject has been altered from an expression of the opinion of a single writer to a representation of the opinions held by many specialists in their own particular spheres. Also, in accordance with the modern trend in