

## CHARLES CYRIL OKELL

1888—1939

THIS *Journal* has sustained a grievous loss by the death on 8 February of its editor, Dr C. C. Okell. When it became necessary to appoint a successor to the late Prof. G. H. F. Nuttall at the end of 1937, it was apparent to all who knew him that Okell was pre-eminently suited for the post. He had wide knowledge and experience of many aspects of preventive medicine, to the science of which he had himself made notable contributions. He had also a retentive memory and a fluent pen, and his leanings towards journalism, which found little scope during the early stages of his medical career, reasserted themselves towards its close. From 1930 onwards he gave much of his spare time to reviewing bacteriological literature, and from 1932 to 1937 he acted as assistant editor of the *Journal of Pathology and Bacteriology*. In the autumn of 1937 he had to retire from his Chair of Bacteriology in the University of London because of a distressing and crippling polyarthritis, but the malady appeared to have become quiescent, leaving him weak in body but with his brilliant intellectual faculties unimpaired. His many friends had hoped that the destiny of this *Journal* would be under his tutelage for many years. Unfortunately his term of office was ended all too soon.

Charles Cyril Okell was born at Douglas, Isle of Man, on 10 December 1888, and was the elder son of Charles Percy Okell. He was educated at Douglas Grammar School and St John's College, Cambridge. From his early student days he manifested a catholicity of taste and interest which at first prevented him from gaining the academic distinction in set subjects which might have been his. He read widely; the natural sciences, literature, philosophy, music, art, the drama, and theology all aroused his interest and enthusiasm from time to time, and enthusiasm with Okell meant detailed study and the acquisition and assimilation of facts from original sources. It also meant discussion, for he was sociable and loved the full and free interchange of ideas with his fellows. As a student he also appears to have had some zest for sport, but though he was a capable boxer in the light-weight class, and played cricket, tennis, badminton and football, these games were never allowed to dominate his other interests.

Okell took the Natural Sciences Tripos in 1911, and then proceeded to St Bartholomew's Hospital, London, where he gained the Skinner, Wix and Hichens prizes in 1914, and the Brackenbury scholarship in medicine in 1915. His success in open competitive examination with other students revealed powers hitherto unknown to himself and encouraged him to take his chosen profession even more seriously, and, later on, to specialize in laboratory work. During this fruitful period at Bart's his early love of literature was not neglected,

for he characteristically used the Wix prize to purchase a selection of the works of early English authors.

The war was an unsettling influence during the last year of his medical course. He took the English conjoint diplomas in 1915 and remained for a few months as House Physician at St Bartholomew's Hospital before obtaining a commission as Temporary Captain, R.A.M.C. His military service took him to France, Palestine and Egypt, where he served with distinction as a regimental medical officer and later in a bacteriological laboratory. He received the Military Cross "for gallant conduct in frequently leading a bearer division over shell-swept ground. His bravery and good example greatly assisted in the removal of all our wounded".

Unfortunately his health was undermined by the hardships he had undergone, and he was invalided from the army with a "rheumatic" complaint which may have predisposed to the severe progressive arthritis from which he died.

After demobilization, Okell took the M.B., B.Chir. Cambridge, and obtained the M.R.C.P., London, in 1921 and the D.P.H., London, in 1923. Later he extended his knowledge of tropical diseases, and obtained the D.T.M. and H. in 1930.

In 1921 he joined the staff of the Wellcome Physiological Research Laboratories as assistant bacteriologist under the late A. J. Eagleton, and from 1923 to 1930 was head of the bacteriological department. During this period he had extensive experience of research in bacteriology and allied subjects and of the application of the results of laboratory investigations to field work in preventive medicine. He had exceptional opportunities for studying the various directions in which the bacteriologist and the public health officer or fever hospital physician could be mutually helpful both in research and routine.

Between 1921 and 1930 Okell made a number of contributions, either alone or in collaboration with R. A. O'Brien, A. J. Eagleton, A. T. Glenny, H. J. Parish, T. Dalling, J. W. Trevan and others, to the bacteriology and immunology of diphtheria, scarlet fever, and other streptococcal infections, tuberculosis, leptospiral jaundice, bacillary dysentery and other diseases.

He was closely associated with some of the earliest work in the British Isles on modern methods of prevention of diphtheria. He had extensive experience of the Schick test and active immunization, and described a new method, which involved the use of the Schick test, for controlling an outbreak of diphtheria. The newer forms of diphtheria prophylactic [Toxoid (1924), Toxoid-Antitoxin-Floccules (1926), and Alum Precipitated Toxoid (1930)] were in the first instance either tested by him or with his collaboration. He also studied the Ramon flocculation test, the intradermal virulence test in the guinea-pig, and the relationship between virulent and avirulent diphtheria bacilli.

Okell was also associated with the introduction into this country of the Dick test and active immunization against scarlet fever. The first Dick test

in England was made on his forearm. The toxin he had prepared was a potent one, and produced a large reaction with "pseudopodia" and red lines along the lymphatic channels of his arm. Its progress was watched by his colleagues with some anxiety, but Okell appeared unconcerned and studied it with interest. At that time many of the properties of sterile streptococcal filtrates were unknown, and this was the first demonstration that Dick toxin caused redness along the lymphatics. From 1927 to 1930 important papers were published from his laboratory dealing with the titration of scarlet fever antitoxin in the rabbit, and he also began to take an interest in the serology of other streptococcal infections including puerperal septicaemia.

He collaborated in the investigation of methods for the standardization of tuberculins for human and veterinary use, and also carried out experiments with B.C.G. and sanocrysin.

Okell's readiness for team work with his veterinary colleagues led to the joint discovery that the widespread disease of dogs called "yellows" was due to the *Spirochaeta icterohaemorrhagiae*. The research was continued until methods of prevention with vaccine and of treatment with an immune serum had been developed and perfected.

He investigated the nature of dysentery (Shiga) toxin and the titration of the antitoxin and made them the subjects of useful papers. In these researches, as in all his other work on the standardization of biological products, he did not overlook the importance of statistical methods.

He also collaborated in exploring the possibility of vaccinating monkeys against the virus of yellow fever—work which at that time involved considerable risk.

He was ever on the look-out for the unusual in the course of routine work, and would never pass over an unexpected phenomenon. For example, one day he noticed that mice developed jaundice after the injection of a certain batch of horse serum and decided that further investigation was imperative. It was found that the aberrant serum had the capacity of producing haemagglutination of mouse cells *in vivo*.

He was honorary secretary of the Section of Pathology and Bacteriology at the Annual Meeting of the British Medical Association at Bath in 1925, and honorary secretary of the Section of Comparative Medicine of the Royal Society of Medicine from 1929 to 1931.

Amid all these activities Okell found time to continue his wide reading. A love of English literature maintained its hold on him, and what he once read he never seemed to forget. Art always interested him in all its forms. He had ambitions once as a fisherman, and although he did not have an opportunity to acquire special skill, the methods and devices of the angler became for a time a major study.

He was lucid and telling in public utterance, and this, combined with his keenness and sympathy, made him an excellent teacher. The academic side of his profession had always appealed strongly to him, and it was no surprise

when he was appointed to the Chair of Bacteriology at University College Hospital in 1930.

Okell owed much to the friendship and collaboration of Boycott during his early years at University College Hospital. He responded well to the stimulus of contact with students, whose difficulties and interests he made his own. In 1932 he chose the haemolytic streptococci as his subject for the Milroy Lectures, delivered before the Royal College of Physicians. The tradition of this lectureship is to secure acknowledged experts on their subjects and to encourage them to give of their best, but even so Okell's contribution was outstanding. For many years it was difficult to find an important article on the immunology of the *Streptococcus* which did not quote the facts and observations so ably summarized and commented upon by him in these lectures.

In 1932, shortly after these lectures were delivered, he became F.R.C.P., London, and in 1937 he received the M.A. and Sc.D. degrees from the University of Cambridge.

Before his illness restricted his activity and even later from his bed or invalid chair, he continued to stimulate valuable research on the streptococci. Two papers with S. D. Elliott on the transient bacteraemia, which is associated with dental sepsis, and on cross-infection with haemolytic streptococci in hospital wards are still being discussed, and the second is having far-reaching influence on current medical and surgical practice. His contributions to medical literature during this period included an unsigned leaflet distributed with the *Journal of Pathology and Bacteriology* "On the quantitative study of tumours". This article or "squib", as he himself called it, deserved the wide interest it aroused, for it is a fine example of his penetrating insight, literary skill and kindly good humour; it is all the more remarkable because it was written when he was suffering considerable pain. With gentle irony he criticized writers who measure tumours by eggs, peas, walnuts or golf-balls.

Just over a year ago he contributed five articles "From a bacteriological back-number" to the "Grains and scruples" series of unfettered thoughts published in the *Lancet*. In his inimitable style and with the same philosophical outlook on men and affairs he gave his views on such diverse subjects as mass immunization, medical education, medical classics, the doctor from the patient's standpoint, and the National Fitness Campaign. That he was able to accomplish so much in spite of increasing weakness and immobility and intermittent pain is evidence of a rare and indomitable spirit and a calm philosophy of life.

During his last year at Cambridge he had undertaken the supervision of a small number of students who were reading pathology for Part II of the Natural Sciences Tripos. With his outstanding qualities of mind and wide experience he was ideally suited for informal discussion outside the confines of University departments. Tutorial work was a source of much pleasure to him, and had he survived would have been gradually extended. The keen personal interest which he took in his pupils both at Cambridge and in happier

days at University College was returned in the affection and respect in which he was held by all of them.

During his long and trying illness, when he was lying in bed almost completely immobilized, it was very remarkable how he retained his interest in his former investigations. He would talk for hours about the recent developments of work in which he had taken a part, and would always be ready to give suggestions and constructive criticism. When he was discussing these matters he appeared to be quite oblivious of his own distressing condition, and he preferred to talk about scientific subjects rather than of his own affairs. His many friends mourn a man, courageous and cheerful in adversity, unselfish and unswervingly loyal, endowed with rare intellectual gifts but modest and unassuming at all times.

Okell married in 1917 Dorothy Gladys, younger daughter of Mr W. O. Roberts of Loughborough, who survives him with two daughters. His elder daughter was of great assistance to him in his editorial and literary activities.

H. J. PARISH.

#### LIST OF SCIENTIFIC PUBLICATIONS

1922

HARTLEY, P., EAGLETON, A. J. & OKELL, C. C. "The desiccation of serum and other protein solutions." *J. Path. Bact.* **26**, 53-65.

1923

O'BRIEN, R. A., EAGLETON, A. J., OKELL, C. C. & BAXTER, E. M. "The Schick test and active immunization." *Brit. J. exp. Path.* **4**, 29-33.

1924

GLENNY, A. T. & OKELL, C. C. "The titration of diphtheria toxin and antitoxin by flocculation methods." *J. Path. Bact.* **27**, 187-200.

EAGLETON, A. J., O'BRIEN, R. A. & OKELL, C. C. "The rapid control of diphtheria outbreaks in institutions." *Lancet*, **1**, 800-801.

OKELL, C. C. & BAXTER, E. M. "The Dick reaction in scarlet fever." *J. Path. Bact.* **27**, 342-5.

OKELL, C. C. & BAXTER, E. M. "The fermentative reactions of the diphtheria bacillus." *J. Path. Bact.* **27**, 439-47.

OKELL, C. C., DALLING, T. & PUGH, L. P. "Enzootic jaundice (yellows) in dogs." *Vet. Rec.* **4**, 1002.

OKELL, C. C. & PARISH, H. J. "A note on haemolysin and haemagglutinin with reference to the Wassermann reaction." *Brit. J. exp. Path.* **5**, 355-60.

1925

OKELL, C. C., DALLING, T. & PUGH, L. P. "Leptospiiral jaundice in dogs." *Vet. J.* **81**, 3-35.

OKELL, C. C. & PARISH, H. J. "The Dick test in scarlet fever." *Lancet*, **1**, 712-14.

HOUSTON, A. & OKELL, C. C. "Examination of well water for Leptospirata." *20th Rep. Metrop. Wat. Bd, Lond.*, pp. 43-51.

OKELL, C. C., DALLING, T. & PUGH, L. P. "Discussion on canine jaundice: with special reference to leptospiiral infection." *Proc. roy. Soc. Med.*, Sect. of Comp. Med., **18**, 17-23.

O'BRIEN, R. A. & OKELL, C. C. "Discussion on Dick reaction and the serum treatment of scarlet fever." *Lancet*, **1**, 1294-7.

O'BRIEN, R. A. & OKELL, C. C. "Some problems connected with the Dick test." *Lancet*, **2**, 1327-9.

## 1926

DALLING, T. & OKELL, C. C. "Vaccine treatment of canine leptospiral jaundice." *J. Path. Bact.* **29**, 131.

OKELL, C. C. & STEED, G. I. "Haemagglutination by horse serum, and jaundice in mice." *J. Path. Bact.* **29**, 132-3.

OKELL, C. C., PARISH, H. J., O'BRIEN, R. A., DREYER, G., CUMMINS, S. L. & BUXTON, J. B. "The standardization of tuberculin and the precipitin test." *Lancet*, **1**, 433-4.

PARISH, H. J. & OKELL, C. C. "A note on the isolation of virulent diphtheria bacilli from wounds of horses." *Brit. J. exp. Path.* **7**, 173-4.

O'BRIEN, R. A. & OKELL, C. C. "Discussion on relationship of streptococci to scarlet fever and its complications." *Brit. med. J.* **2**, 513-15.

OKELL, C. C. & PARISH, H. J. "The virulence testing of the diphtheria bacillus and its practical application." *J. Hyg., Camb.*, **25**, 355-65.

## 1927

PARISH, H. J. & OKELL, C. C. "The titration of scarlet fever antitoxin in rabbits." *Lancet*, **1**, 71-2.

OKELL, C. C. & PARISH, H. J. "The standardization of tuberculin." *Brit. J. exp. Path.* **8**, 170-5.

PARISH, H. J. & OKELL, C. C. "The titration of scarlet fever antitoxin in rabbits." *J. Path. Bact.* **30**, 521-8.

OKELL, C. C. "Immunization as a practical means of disease prevention in children." *National Health*, **20**, 245.

## 1928

OKELL, C. C. & PARISH, H. J. "Vaccination of guinea-pigs against tuberculosis with B.C.G." *Brit. J. exp. Path.* **9**, 34-42.

O'BRIEN, R. A., PARISH, H. J. & OKELL, C. C. "The biological properties of Schick and Dick toxin." *Public Health*, p. 181-2.

PARISH, H. J. & OKELL, C. C. "Haemolytic streptococcal infections in the rabbit." *Lancet*, **1**, 746-8.

OKELL, C. C. & PARISH, H. J. "The relationship of scarlet fever to other streptococcal infections." *Lancet*, **1**, 748-50.

OKELL, C. C. & BOOTH, W. G. "Epidemic catarrhal jaundice." *Public Health*, p. 237.

PARISH, H. J. & OKELL, C. C. "The permanence of the Schick negative state." *Lancet*, **2**, 322-3.

## 1929

PARISH, H. J. & OKELL, C. C. "Three notes on tuberculin." *J. Path. Bact.* **32**, 51-6.

BLAKE, A. V. & OKELL, C. C. "Standardization of anti-dysentery serum: effect of increased test dose of toxin on the accuracy of titration." *J. Path. Bact.* **32**, 121-6.

O'BRIEN, R. A., OKELL, C. C. & PARISH, H. J. "'Diphtheria' in Schick negative reactors." *Lancet*, **1**, 149-51.

O'BRIEN, R. A., OKELL, C. C. & PARISH, H. J. "Titration of scarlet fever antitoxin." *Brit. J. exp. Path.* **10**, 83-93.

BLAKE, A. V. & OKELL, C. C. "Seasonal variation in the susceptibility of mice to dysentery (Shiga) toxin." *Brit. J. exp. Path.* **10**, 175-9.

MONTAGU LAWRENCE, C. J. & OKELL, C. C. "The association of human and canine jaundice with an illustrative case." *Lancet*, **2**, 327-8.

## 1930

- OKELL, C. C. & BLAKE, A. V. "Dysentery toxin (Shiga): Notes on its preparation with a discussion of its position as an endotoxin." *J. Path. Bact.* **33**, 57-63.
- OKELL, C. C. "The relationship of virulent to avirulent diphtheria bacilli." *J. Hyg., Camb.*, **29**, 309-12.
- PARISH, H. J. & OKELL, C. C. "The relative insusceptibility of young rabbits to streptococcal toxin." *J. Path. Bact.* **33**, 527-32.
- OKELL, C. C. "Preparation and standardization of tuberculin." *A System of Bacteriology*, M.R.C. **5**, 308-12.
- OKELL, C. C. "Experiments with yellow fever vaccine in monkeys." *Trans. R. Soc. trop. Med. Hyg.* **24**, 251-4.

## 1931

- OKELL, C. C. & PARISH, H. J. "The effect of sodium aurothiosulphate in the treatment of tuberculosis in guinea-pigs." *Brit. J. exp. Path.* **12**, 136-8.

## 1932

- OKELL, C. C. "The role of haemolytic streptococci in infective disease." (Milroy Lectures.) *Lancet*, **1**, 761-7; 815-20; 867-73.
- OKELL, C. C. "Attenuation and prevention of measles." *Brit. med. J.* **2**, 397-8.
- OKELL, C. C. & D'ARCY HART, P. "Simple apparatus for venesection." *Lancet*, **2**, 514.

## 1935

- OKELL, C. C. & ELLIOTT, S. D. "Bacteraemia and oral sepsis with special reference to aetiology of subacute endocarditis." *Lancet*, **2**, 869-72.

## 1936

- OKELL, C. C. & ELLIOTT, S. D. "Cross-infection with haemolytic streptococci in Otorhinological Wards." *Lancet*, **2**, 836-42.

## 1938

- OKELL, C. C. "'From a bacteriological back-number'—Grains and scruples series." *Lancet*, **1**, 48, 107, 159, 225 and 287.