OBITUARY NOTICE

Allan Watt Downie
5th September 1901–26 January 1988

Allan Downie is assured of a place in medical history for his part in the eradication of smallpox. His many friends and co-workers, especially those who were fortunate enough to work in his department, will remember him with great affection for those personal qualities which made him an ideal chief and colleague.

Early years

Allan and Ricky, his identical twin, were born in Rosehearty not 100 yards from the harbour whence sailed their father William, a deep sea fisherman. The twins were the youngest of the eight children of William and Margaret (Watt) Downie. Out of the village school, life was all rocks, water, swimming, observing the life of the sea birds on the cliffs, and above all, fishing; fishing off the rocks, from a row-boat, or best of all, at sea in their

brothers' large steam drifter. To Allan and Ricky, Rosehearty remained a spiritual and lifelong home to which they returned for countless summers, first with children and then with grandchildren.

Alexander Forbes, their Headmaster, early saw great talent in the twins. He coached them in maths and Latin and persuaded William and Margaret Downie to send them to Fraserburgh Academy. Their scholastic success and their position at the tail of the family made University possible. As Allan told us over tea in the laboratory, "This meant teaching, the Ministry, or Medicine. As neither of us wanted either of the first two, it had to be Medicine".

Thus it was, that from 1918 to graduation with first class honours in 1923, the twins collected between them every undergraduate prize in the Faculty of Medicine at Aberdeen. Thirty-four years later, when presenting Allan for an Honorary LL.D in the University of Aberdeen, the Public Orator

recalled that at their graduation the Professor of Medicine had disclosed the astonishing fact that the totals of marks gained by the two boys in their four professional exams were identical, and also that their marks in finals were so close that he had seen fit to allow the pair to divide the prize allocations between them in their digs!

Medical practice

Within an hour of Finals results being announced, chance took a hand. John Cruickshank, Head of Bacteriology at Marischal College, sent his assistant across the road to the Kirkgate Bar where the 'year' was celebrating, with the instruction "Get me one of the Downie twins". As Allan recounted the tale "When Cruickie's assistant came in, Ricky had just struggled through to the bar, leaving me by the door". Thus it was Allan who was invited to work for the demanding but stimulating man who shortly afterwards became Professor of Bacteriology in the Medical School.

While waiting for the October start of his appointment, Allan worked for three months as an assistant in Dr Pettigrew's practice in Attercliffe, Sheffield. In October, Allan returned to Aberdeen, while Ricky replaced him in the Sheffield practice, where he stayed happily till his retirement. Ricky told us that the patients never noticed the exchange!

Allan stayed for 4 formative years with John Cruickshank, whose department proved to be a seed-bed for future professors, producing in due time six; a record which Allan himself later equalled. Cruickshank was a demanding chief and when Downie left him in 1927 for Shaw Dunne's Pathology Department in Manchester, he was already a productive, self critical research worker. He stayed with Shaw Dunne long enough to acquire a profound and lifelong respect for and interest in histopathology. It was, however, his move to Hugh Maitland's Department in Manchester which first brought him in touch with virological research and with the growth of viruses in tissue cultures. Work with McGaughy, who was a veterinary pathologist, showed for the first time not only that mousepox virus could grow in tissue culture but also that it produced the same kind of cytopathic changes as characterised the disease in mice. This work was published in 1936, more than a decade before the use of tissue cultures in virological research achieved general acceptance.

In 1929 Downie presented his MD thesis on streptococcal diseases and for this he was awarded the degree with Honours and the Thursfield Prize. In that same year, Maitland piloted him into

membership of the Pathological Society of Great Britain and Ireland. The Society, then only 23 years old, has good reason to be grateful to A.W.D. He was an enthusiastic member who rarely missed a meeting. Later he shepherded his own juniors to come and to join. He ensured that they met the more senior Society members (and back at the laboratory, enlivened yet another tea break with stories about them!). He made sure we all presented papers, that we needed no notes, that he could hear us from the back at rehearsals, and, most important, that our slides filled the screen and could be read from the back! For his own part, Downie was for 9 years an outstanding General Secretary. He was also Editor of the *Journal of Pathology and Bacteriology* from 1943 to 1946, in which role he complemented Matthew Stuart and, later, C. L. Oakley in ensuring the highest standards of lucid English for the *Journal*.

From Maitland's Department, he went for a short period to Karl Prausnitz in Breslau, where he perfected the German he had already taught himself so as to be able to participate in the German reading evenings he attended at John Cruickshank's home. Allan remained a lifelong friend of the distinguished German (who, thereafter, became Prausnitz-Giles) when he came to England as a refugee at the approach of war.

Three more years with H. B. Maitland produced Downie's DSc thesis and an appointment to the prestigious Senior Freedom Fellowship at the London Hospital, under the terms of which he was required to spend 9 months at the Rockefeller Institute in New York working with O. T. Avery. Here, Downie made new friendships with that astonishing group who had gathered around Avery and who were to become the leaders of American microbiology; Tommy Francis, Rene Dubos, Ken Goodner, Wally Goebel, Colin McLeod, Frank Horsfall and Rebecca Lancefield, as well as with the then Rockefeller Hospital staff: Alfred Cohn, Homer Swift, Donald van Slyke, Tom Rivers and his assistants Joe Smadel and Tom McNair Scott.

He returned to London and to work with pox viruses in 1935. The vaccine in routine use for smallpox immunisation at that time was believed to be a cowpox virus (hence the name). Downie, having isolated a strain of genuine cowpox virus from an outbreak of the disease in cows near Brighton, was able to show that this virus and the virus in vaccine lymph were no closer than cousins. This finding challenged both conventional wisdom and history. It was then 1939, war was imminent and it was no time for a seemingly academic pursuit, but the enigma (and the virus suspensions) re-

At Rosehearty School in 1906, during the headmastership of Mr Alexander Forbes, now retired, there were four pairs of twins attending at the same time. The two boys on the front left are Richard and Allan Downie, who graduated in medicine at Aberdeen University with high distinction. A curious fact mentioned at their graduation was that the class marks for their medical course were equal in total (Aberdeen Evening Express, 1936).

mained with Downie; 8 years were to pass before he could return to them.

The war years

In 1939, the Ministry of Health established a chain of self-sufficient Emergency Public Health Laboratories. Invasion by Germany was expected and there seemed every possibility that parts of the country would be cut off. Water supplies to cities could fall into enemy control and these laboratories were to be ready to cope with whatever should befall. The South Coast and East Anglia were prime targets for invasion. Downie was directed to take charge of the E.P.H.L. at Cambridge. There followed a torrent of Public Health and Hospital work, on such differing subjects as diphtheria, in which he collaborated with D. T. Robinson in

Manchester and J. W. McLeod in Leeds, and in the identification of strains of *Salmonella*, not previously encountered in Britain, which had been derived from American spray-dried egg imports. The challenge was truly diverse; from tetanus diagnosis in war wounds through leptospirosis to the making of rabies vaccine for the troops!

The expected invasion never came, but the versatility and spirit of independence engendered in those who stood ready, laid the foundations of the present P.H.L.S., which became the envy of the world.

Professorial years

In 1943, after 4 years in Cambridge, Downie accepted the offered Chair of Bacteriology in Liverpool and started the most productive years of

his life. Hedley Wright had been both City Bacteriologist and Professor. Now the posts were split and Downie's old friend D. T. Robinson was appointed to the City Bacteriology post with the title of Associate Professor. For 11 years thereafter, the two departments lived in close harmony, sharing media room and, of course, the tea room vital to all research and to the education of junior staff!

The 8-year-old suspensions of vaccinia and cowpox viruses from the London Hospital, which had been stored at 4°C, were scarified into shaved rabbits, found still to be viable, and so began the work which was to lead to the world eradication of smallpox.

As the troops returned from endemic areas, smallpox began to be imported into the UK. Also, as trade with Africa and India was resumed, it brought in compressed bales of cotton which, on occasions, contained smallpox crusts. Downie's familiarity with animal pox viruses, acquired through pure academic study, enabled him to set up an efficient, economical and rapid, diagnostic service for the whole of the UK. As disease imports became more numerous, several other laboratories were established to provide more local services, but Liverpool, under Downie, became the Mecca for those wishing to undertake the challenging task safely. They came from Holland, Germany, France, Russia, Brazil, China, India and the Far East. Countless strangers came to learn Downie's laboratory methods and his policy for safe working, and all of them went away as friends. His charm and honesty, and above all his generosity with ideas, laid a sound, worldwide foundation for international collaboration which became effective in later years as the eradication plans unfolded.

What must have amazed the visitors was not only his remarkable technical skill but the prudent economy with which all this activity was effected. Two Hearson's incubators, a farmyard chick incubator bought at auction for £5 and converted DIY-style from paraffin to electricity, an old treadle dental drill scrounged from the Dental Hospital to cut windows in the eggs, a couple of waterbaths and racks, two microscopes, a Cambridge rocker and wax-oven, and a bench centrifuge; plus lots of Lysol—that was about it! The technology for total containment did not then exist. (Does it even today?). Therefore, Downie relied on proven vaccination, by Downie himself, of everyone who worked in or on the building or who otherwise might be at risk (and their families if he judged it desirable). This included the window cleaners, plumber and the fridge service man for example.

Space did not allow Downie an office separate

from his laboratory, so unvaccinated visitors were excluded. If they did get in, the price was immediate vaccination! A bowler-hatted Queen's Messenger carrying secrets from Porton who got in at lunch time and was found sitting on the smallpox bench (the only bench!) so suffered, as well as having the seat of his pants U-V irradiated by one of us, until Downie returned from Senate two hours later. It was, truly, a very happy laboratory in which to work.

Smallpox eradication

Downie's intimate knowledge of the capabilities and limitations of vaccination, together with his detailed studies of the period of infectivity of natural smallpox, as determined both by his careful on-the-spot analysis of each outbreak studied and also by sequential laboratory tests on the specimens from the victims, really provided the groundwork on which the W.H.O. eradication campaign was based. Perhaps the greatest single contribution was his confident belief in smallpox eradication as an attainable objective. Weeks were spent in Geneva as Reference Expert on Virus Diseases for W.H.O. and as a Member of the Expert Commission on Smallpox, and later as Chairman of the W.H.O. Scientific Group on Smallpox. Downie gave his total cooperation without reserve both in committee and also in the field, especially in Madras where he worked with Henry Kempe and A. R. Rao.

Preliminary trials had shown the futility of attempts to achieve control by universal vaccination. Downie's laboratory studies provided solid factual back-up for the concept that patients were not infective till the rash appeared, despite becoming ill on the 12th day of their 14-day incubation period. It was thus apparent that any focus could be contained if all contacts could be vaccinated and isolated by the time their fever became apparent. This knowledge gave the necessary time for contact tracing.

The concept was simple, its execution by W.H.O. was a tour de force which engaged Downie's fullest enthusiasm. His retirement in 1966 gave him the opportunity to give his whole attention to promoting the success of the campaign first in the USA and then in India.

Later work

With the success of the campaign in sight and proof building up towards certainty that there were indeed no animal carriers of smallpox, Downie turned his attention back to a topic which had engaged it in an earlier year. He returned to his old

laboratory with an M.R.C. grant to investigate the epidemiology of a new pox virus, which he himself had first isolated from children in the Tana River valley in Africa.

That work completed and published, and he being only 73 and his golf handicap still in single figures, he took on a locum post (sharing half time with Harold Sheehan) as Consultant Pathologist to one of the large Liverpool teaching hospitals; a commitment which endured for 5 years.

In 1979, eradication was declared to have been achieved. In 1980, the Royal College of Physicians acknowledged Downie's contribution by making him a Fellow. The Royal Society had recognised his earlier scientific work with an FRS in 1955.

Above all, Allan Downie was a teacher and a devoted servant of the University. He served as Dean of Medicine and as Pro-Vice Chancellor, but one had only to sit with him as examiner in Final vivas to realise that he was always on the side of the student. He could not abide ignorance but was

always full of hope that light would soon dawn. It was never too late to teach. Perhaps Allan's faith in humanity is summed up by Professor Paddy Meenan's answer to the question "How did they do?" (posed by one of us as the pair emerged from a particularly gruelling morning of vivas)—"I thought Allan answered some quite tricky questions very well!"

It is a constant pleasure for his colleagues to remember Allan Downie, but we must at the same time remember with sorrow how much his family will be missing him. Perhaps they will draw comfort from the realisation that he will be remembered not so much as an astute and far seeing scientist nor for his outstanding contributions to the University but, above all, as a lovable man who followed so ably the proud tradition of those Scots country lads whose intelligence and diligence carried them into the forefront of human achievement.

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