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SHELDON FRANCIS DUDLEY

1884-1956

SHELDON FRANCIS DUDLEY, destined to become Medical Director-General of the Royal Navy in the second World War, was born under the care of his future Service in the Royal Naval Sick Quarters, Lisbon, on 16 August 1884. His father, John Dudley, was a medical officer in the Royal Navy who, when he retired in 1906, had reached the rank of Deputy Inspector-General (equivalent today to the rank of Surgeon Captain). The Dudleys were a Quaker family, whose forbears were alleged to have settled in Co. Tipperary, Ireland, at the time when the Pilgrim Fathers fared further west to America. Sheldon Dudley’s uncle was for many years Protestant Rector of Glenarm, Co. Antrim. His mother was Edith Bella, eldest daughter of Richard Whittington, Prebendary of St Paul’s and Rector of St Peter’s, Cornhill, who was said to be a direct descendant of Robert, a brother of the famous Dick Whittington. Prebendary Whittington was well-known in the City of London and was for a time Master of the Merchant Taylors Company and twice Chaplain to the Lord Mayor. Dudley had one brother, two years his junior, who was killed on the Somme in the 1914-18 war. In 1913 Dudley married Ethel Edith Wood (née Franklyn), a widow with one son. There were no children of the marriage. Dudley died on 6 May 1956, and is survived by his widow.

When he was three years old Dudley was brought home to England by his parents, and three years later accompanied them overseas again—this time to Yokohama, where his father became Principal Medical Officer to the Royal Naval Sick Quarters. At this early age the boy began to evince an interest in natural history, and was taught by his father how to use a microscope. Returning home to Chatham in 1893, he was sent to a ‘dames’ school, where he says he learnt little, but, during his holidays, he pursued his hobby of studying pond life and the common objects of the sea-shore—a hobby which on one occasion led to his being punished for dissecting a fish on the dining-room hearth-rug. When he was eleven he entered Merchant Taylors’ School, and about this same time he met Sir Albert Seward (later Foreign Secretary of the Royal Society), who was a connexion by marriage of the Whittington family. Seward fired young Dudley’s interest in research by his talks on palaeobotany, and allowed him to examine sections of fossil plants at the Natural History Museum in South Kensington. At first, Dudley was on the Classical side at Merchant Taylors’ and, except in mathematics, he did badly, having no flair for languages. Because of this, his parents—who had hoped
he would in due course enter the Church—reluctantly had him transferred to the Modern side. In this new environment he quickly found himself at home and became much interested in science—physics, chemistry and biology. He passed the London Matriculation examination at the age of fourteen, being the first boy ever to pass the Preliminary Science examination straight from school. As a reward for this, he was reinstated on the ‘Prompter’s Bench’ (Prompter at Merchant Taylors’ was a junior monitor) from which he had previously been publicly ‘disrated’ for smoking in class. At the end of his school career, while in the Sixth Form, he distinguished himself by winning the ‘chief science prize’ and a scholarship to St Thomas’s Hospital, for which he had competed in pursuance of his ambition to qualify in medicine and enter the medical service of the Royal Navy. He began his studies in St Thomas’s Medical School in October 1901, and found no difficulty in qualifying as M.R.C.S. and L.R.C.P. in the normal period of five years. He joined the Royal Navy in November 1906 without taking any house appointments, following the advice of his father, who said that if it was his intention to enter the Navy the sooner he got in the better. In fact, the father, although a naval officer himself, was opposed to the career that his son had selected. He did not want young Dudley to ‘waste his life’ in the medical service of the Royal Navy, and said that, if he insisted on doing so, he (the father) saw no reason to spend more than the minimum on his medical education. Dudley regretted that this decision made it impossible for him to go to Cambridge or take on house appointments, as he otherwise would have done—but he never regretted entering the Navy.

Among the teachers at St Thomas’s Medical School, those who made the greatest impression on him and played a considerable part in shaping his subsequent career, were Shattock (pathology), Dudgeon (bacteriology) and Sir Cuthbert Wallace (surgery). They influenced him because they were not only good teachers but also active research workers in their different spheres. He won a few unimportant distinctions and prizes as a medical student, but he had little interest in the routine type of work required for passing examinations, which he regarded as a necessary evil. In fact, he tended to neglect study of this kind, and spent much of his time in desultory reading and in the study of certain aspects of microbiology which had little to do with the examinations of the standard medical curriculum.

Despite his studious habits, young Dudley was no mere bookworm, being above the average at games. At the age of sixteen he was six feet tall (he ultimately grew to six feet one and a half inches), and at a weight of thirteen stone was a ‘good bustling forward’ at football. He played both football and water-polo for St Thomas’s Hospital and toured with the Old Merchant Taylors’ XV at Easter and Christmas. After joining the Navy he played for the United Services at Plymouth, but did not get his Navy cap. Though naturally good at games, his main interests lay elsewhere and he did not take sport seriously enough to devote much time to training. He was a first-class swimmer, pulled a good oar, and was proficient in handling small sailing boats.
Of the thirty-nine years which Dudley served in the Navy, twelve were spent at sea. In the interval before the first war he served successively in the Mediterranean, China and Home Fleets, latterly in H.M. Hospital Ship Maine. At the beginning of the first world war he was pathologist and venereologist at the Royal Naval Hospital at Chatham. Later he was appointed Senior Medical Officer of the Royal Naval Aircraft Depot, Dunkirk, then of H.M. Hospital Ship Agadir. In 1919 he was made Pathologist at Haslar, and in 1921 became Professor of Pathology at the Royal Naval Medical School at Greenwich, an appointment which he held for three years. At sea again, he spent a year as Senior Medical Officer of H.M.S. Barham in the Mediterranean Fleet, and thereafter was posted to the New Zealand Station, where he made so good an impression on his colleagues ashore that he was approached by Otago University in connexion with the Chair of Pathology, which however he refused. He returned to Greenwich in 1927 and, on promotion to Surgeon Captain in 1930, became Director of Medical Studies and Professor of Naval Hygiene at the Medical School and later Medical Specialist at Chatham. In 1936 he was promoted Surgeon Rear-Admiral and became the first Deputy Medical Director-General. In 1938 he was made Medical Officer in Charge of the Royal Naval Hospital, Chatham, and in July 1941 he took over the appointment of Medical Director-General, with the rank of Surgeon Vice-Admiral. He filled this onerous post, with an extension of the normal period of tenure, until the war was over, and then—to quote his personal record—posted himself, in the rank of Surgeon Captain, as Principal Medical Officer to the Royal Naval Hospital, Bermuda, where he ‘became an ordinary clinician or G.P., opening sailors’ bowels and whitlows with great zeal after fifteen years of more or less administration work in a bureau’. He returned home and retired in 1947, his main occupation thereafter being the writing of his two books, The four pillars of wisdom and Our national ill health service. He made a partial return to public life in 1951, when he acted as medical adviser to the Science Director of the Festival of Britain, and wrote scripts for displays of medical and health subjects.

**Further qualifications and distinctions**

Dudley made good use of his periods of home service to obtain higher medical qualifications. In 1920 he took the M.D. (London) and D.P.H., and in 1921 the D.T.M. While studying at the London School of Hygiene and Tropical Medicine he won the Duncan and Lalacaca Medals and in 1922 was awarded the Gilbert Blane Medal, a special adjudication for conspicuous zeal and professional ability. In the same year he won the Liddell Triennial Prize of the London Hospital for a paper on the epidemiology of influenza, and in 1923 an essay on the carrier problem gained for him the Neech Prize of the Society of Medical Officers of Health. After returning from overseas service he took his M.R.C.P. in 1928, and was elected to Fellowship in 1933.
Biographical Memoirs

He was given the Chadwick Prize and Gold Medal in 1930 in recognition of his work on diphtheria immunization, and in 1931 was Milroy Lecturer of the Royal College of Physicians, his subject being ‘Lessons in the distribution of infectious diseases in the Royal Navy’, for which he analyzed the figures given in The health of the navy from the date of the inception of this publication.

In these years he held various offices in learned societies. He was President of the War Section (now defunct) of the Society of Medical Officers in 1929, and of the War Section (now the United Services Section) of the Royal Society of Medicine in 1930. He was President of the Section on Epidemiology and State Medicine of the Royal Society of Medicine in 1935 and 1936, and Vice-President of the Royal Society of Tropical Medicine and Hygiene from 1939 to 1941.

His first Service decoration, which he received in 1919, was the O.B.E. In 1939 he became Honorary Surgeon to the King and in 1940 was awarded the C.B., and subsequently in 1942 was elevated to K.C.B. In recognition of his services to the naval medical interests of the United States during the second World War he received the Legion of Merit, Degree of Commander, of U.S.A., 1946. The citation for this honour is as follows: ‘Vice-Admiral Sir Sheldon Dudley, British Navy, performed outstanding service from July 1942 to May 1945 as Medical Director-General, Royal Navy. He demonstrated unusual co-operation in placing at the disposal of the United States Army the facilities of British Naval Hospitals. He was instrumental in arranging for the use of two naval hospital ships to support our landings in North Africa, Sicily, and Italy. He played an important part in assisting the United States Army Medical Corps during the planning period of the invasion of France. Vice-Admiral Dudley’s work materially assisted the joint Anglo-American war effort and reflects great credit on himself and on the British Navy.’ (Dudley writes that this was a most anxious responsibility; the U.S. hospital ships which had been promised failed to be ready in time. He was gratified that the U.S. authorities realized the risk he accepted, i.e. that the diversion of hospital ships might let our own troops down). He was also made Commander, Legion d’Honneur, France, 1947, Grand Commander of the Order of St Olaf, Norway, 1947, Knight Grand Cross of the Order of Orange Nassau, Netherlands, 1947.

He was elected to Fellowship of the Royal Society in 1941 (it was ninety years since an officer on the Active List of his Service had been so honoured), and was made an Honorary Fellow of the Royal Society of Medicine in 1945. In 1946, the Royal College of Surgeons, Edinburgh, conferred on him an honorary Fellowship, and in 1953, on delivering the Lind Oration at the bicentenary celebrations in Edinburgh, he received the honorary degree of LL.D. of the University of that city. In 1947 he was admitted to the Freedom of the Worshipful Company of Barbers. As a youth he was ‘apprenticed’ to his grandfather, Prebendary Whittington, as a Merchant Taylor, and in 1949 he became a Freeman of the Merchant Taylors Company and also of the City of London.
The research background

In the services, 'pathology' is a comprehensive term, and in Dudley's young days the holder of an appointment in this subject had to be a morbid anatomist, bacteriologist, serologist, haematologist, and to a lesser extent chemist and biochemist. He was, moreover, expected to be a clinician of no mean standing and, in all matters pertaining to laboratory diagnosis, to be guide and counsellor to the young medical officer first faced with the problems of infectious disease peculiar to community life. Dudley’s training and experience in 'pathology' under diverse conditions during his early years in the Navy, coupled with his natural leaning towards mathematics and statistical analysis and his ruminating philosophical approach to the problems which confronted him, led almost inevitably, in the environment in which he served, to his choice of epidemiology as a subject for detailed study—he himself defined his special bent as 'bacteriological epidemiology'. Research was his hobby, and he wisely selected as his subject problems which lay ready-made, to hand, and which were of outstanding importance to the Service in which he passed his life. Reviewing his work and his many publications, one feels, however, that his interests were wider than mere epidemiology and dealt on a broad basis with the preservation of health and with human ecology, two terms which occur frequently in his later writings.

His appointment to Greenwich in 1921, bringing under his supervision the pupils of the Royal Hospital School, afforded him an unrivalled opportunity to study the problems of infectious disease, and marked the beginning of a long period of fruitful research which had far-reaching results. The pupils of this school, mainly the sons of naval ratings, were aged from eleven and a half to fifteen and a half years. They came from all over the country, and joined usually in two separate groups each term, there being the usual three terms in the year. Detailed medical records were maintained of each boy, and it was possible from these to follow the incidence of sickness in each of the three annual batches from beginning to end of their school career. The boys stayed on an average for three years before being drafted to various naval training establishments. There were up to about one thousand boarders and, in addition, some one hundred day-boys. The hygienic conditions and sanitary discipline were good, and water supplies, food, and milk were carefully supervised. The boys had to pass a severe medical test before entering the school, and during their years of residence were kept under strict medical supervision, including frequent examinations of the throat and nose. Although the numbers who slept in the dormitories were high, the space per boy was adequate, and there was no overcrowding, according to accepted standards. In spite of all this, the incidence of certain bacterial diseases, and particularly diphtheria, was considerable. Here was an almost ideal 'experimental herd' (a phrase which Dudley once used incautiously in public, with the result that a question on the ethics of making helpless schoolboys the subject of experiments was asked in the House of Commons!), and in the years until the school
was moved elsewhere in 1933, broken only by his period of four years’ service at sea, he made full use of the opportunities which it offered.

In his later years of service, Dudley's approach to research was, of necessity, less direct, but his interest did not wane, and, if he was personally unable to undertake clinical or bench work, he associated himself with many important investigations, and lent them the full weight of his influence.

Diphtheria

When Dudley was posted to Greenwich in 1921, the incidence of diphtheria among the schoolboys was the cause of much anxiety. Following an outbreak in which there were sixty-one cases in the first term of 1919, there had been a period of comparative freedom, though sporadic cases occurred, until the second term of 1921, when a further outbreak started. This continued throughout the third term, and produced a total of ninety-four cases. All efforts to check the spread of the disease by the methods which were then standard—frequent inspections, throat swabbing, and the segregation of carriers and suspected cases—had proved of no avail. Authority was given to make use of the recently devised Schick test to determine those who were immune and those who were susceptible, and Dudley proceeded in 1922 to carry out a carefully standardized and controlled test on the 831 boarders who were resident at the time. Comprehensive records were available which gave a reliable medical history of all these boys from the time they joined the school, and these enabled him to trace the development of immunity. He approached the problem by dividing the boys into batches according to the term in which they entered the school, and worked out the percentage of immunes—that is, Schick-negatives—in each batch. In this way he was able to relate the rising level of immunity to the length of residence in the school and exposure to the greater risk of infection which existed during the outbreaks. As would be expected, the percentage of immunes in the batch of boys who had been longest in residence was considerably higher than that in the latest recruits. However, when the immunity level was plotted in terms of batches, the resulting curve did not follow a steady course: there were two well-marked steps, each related to the outbreaks of clinical diphtheria, with an intervening period in which a constant level was maintained. Thus, in the new entrants, the level was about 60 per cent. In those batches who had been in the school during the 1921 outbreak but not during the 1919 one, that is, in boys who had been resident from six months to two and a half years, the level was about 85 per cent., while in those who had weathered both outbreaks the level was 95 per cent. Thus there was clear evidence of a substantial rise in the immunity level at the time of, or immediately following, each outbreak of clinical diphtheria. Any possibility that the increased immunity was related to the age of the boys was ruled out by rearranging the figures in age-groups, when there was found to be no significant difference in the percentage of immunes in the different groups.
A careful study of the behaviour of the Schick reaction in clinical diphtheria revealed the rather surprising fact that it was frequently positive in convalescents. In other words, clinical cure had occurred although the circulating antitoxin was below the level required to neutralize the test dose of toxin. However, although these boys continued to be exposed to infection, none of them suffered from a second attack of diphtheria, and a fairly rapid conversion of the reaction took place, so that within nine months 92 per cent had become Schick-negative. During epidemics the carrier-rate was high, and the degree of exposure to infection was therefore much greater than in the inter-epidemic period.

From a consideration of these facts, Dudley concluded that the higher level of immunity in boys who had been in the school during an outbreak of clinical diphtheria could be explained only by the occurrence among them of latent or sub-clinical infection—probably resulting from exposure to doses of bacteria too small to become established and to produce overt symptoms. He considered that his figures afforded experimental proof of this conclusion, and in later years regarded this as his most important contribution to science, because of its wide implications in the general field of immunology.

In carrying out this experiment and in others of later date, Dudley made many useful and practical observations on the interpretation of the Schick test. He showed that pseudo-reactions, which are liable to cause much confusion in the absence of adequate controls, are due to an allergic condition of the skin caused by previous contact with diphtheria bacilli; this allergic condition may develop in a relatively short space of time—a matter of a few months—and may be, although it is not invariably so, a step on the way to immunity. He found that, while carriers of virulent diphtheria bacilli were almost always Schick-negative (sporadic isolations of virulent bacilli might obviously be made from Schick-positives undergoing the latent infection destined to convert them to the Schick-negative state), carriers of avirulent bacilli might be either positive or negative. He made a careful study of the incidence of virulent and avirulent diphtheria bacilli in the boys' throats and of their significance in carriers. He found no constant ratio between cases and carriers, and on occasion noted a high carrier rate of virulent diphtheria bacilli in the absence of clinical diphtheria and in the presence of Schick-positives. He concluded that all Schick-positives were not equally susceptible to infection and that some of them were probably immune to ordinary doses of diphtheria bacilli. He observed that, in carriers, virulent organisms were frequently replaced by avirulent, and he advanced the hypothesis that Schick-positives, when infected with virulent diphtheria bacilli, might suffer latent infection during which the virulent bacilli became non-virulent. He concluded that, at one time or another, 75 per cent of the boys must have been carriers, and that, over all, for every twenty carriers of virulent bacteria there was only one case of clinical diphtheria.

In 1928, largely as the result of Dudley's influence, authority was given for the active immunization of all boys in Greenwich Hospital School who
gave a Schick-positive reaction, and Dudley was able to carry his work to its logical conclusion. The immediate result, as shown by the incidence of clinical diphtheria, was dramatic. From 1919 to 1927 inclusive, there had been over four hundred cases. From the inauguration of active immunization in 1928 until October 1932, only twenty cases (including 'sore throats' with 'morphological diphtheria bacilli' in the throat swab) were reported. Of these, only four were recognizable as clinical diphtheria, and three of them were Schick-positive new entrants who had not been immunized. There was, however, a recrudescence in the last term of 1932 and the first term of 1933 when there were in all twenty-three cases of mild but unmistakable diphtheria. This was somewhat of a shock to Dudley, who had been critical of similar outbreaks reported by others in immunized communities. In a sense, however, it was a fortunate occurrence, because it launched him on a series of investigations which he might not otherwise have undertaken. On making a detailed examination of the strains of diphtheria bacilli isolated, he found that all but two were of the \textit{gravis} type, which at this time made its first appearance in the school. However, this more invasive strain was not necessarily the sole cause of the breakdown, for a series of Schick tests revealed a considerable number of 'relapses in immunity'—i.e. reversion from Schick-negative to Schick-positive. Until this time Dudley had accepted the view, then held in most quarters, that immunity, whether acquired naturally or artificially, was of long duration. He soon found, by making the necessary Schick tests on boys whose previous records were in his possession, that this was not so, and that both naturally and artificially acquired immunity tended, in a percentage of cases, to fall quickly below the arbitrary level set by the Schick test. However, the immune state—i.e. the Schick-negative state—was soon restored by relatively minor stimuli, such as, for example, the small dose of toxin used in the Schick test. Furthermore, he observed that 'relapsed' immunes had in fact considerable resistance, and an attack of clinical diphtheria in such cases was never severe. He thus was able to postulate a permanent basal immunity, a mechanism capable of responding rapidly to stimulation by the specific antigen of the diphtheria toxin. He also showed that the immunity enjoyed by those who are Schick-negative is antitoxic and not antibacterial. Thus, Schick-negatives can be carriers of virulent diphtheria bacilli, and when infection is rife usually show a considerably higher carrier rate than Schick-positives. The obvious but extremely important conclusion to be drawn from this is that, during an outbreak, active immunization will yield satisfactory results only if the whole 'herd' is immunized. (The influence of 'herd' environment, both in this and other matters, was of great interest to Dudley, and he expounded on it at considerable length in several of his papers.) His observations enabled him to conclude that, while active immunization is not infallible, if widely adopted its effect is likely to be cumulative.

In 1940 a nation-wide campaign of active immunization against diphtheria, which has brought about the virtual extermination of this disease, was
initiated in Britain. The decision to undertake this campaign was based on the results reported by many different investigators, among whom Dudley occupied a leading role. Although he dealt in relatively small numbers, the logical reasoning which directed his attention to certain specific points, the care with which his experiments were carried out, and the sound common-sense behind the conclusions he reached, gave to his findings a high degree of authority.

Epidemiology in general

Although Dudley devoted more time to diphtheria than to any other specific infectious disease, his interests were by no means confined to this particular condition, and it is clear that he hoped in his work on diphtheria to uncover basic principles of general application. In a selected but semi-isolated community of fit young men, such as is found in units of the Royal Navy, infectious diseases, and in particular minor infectious diseases, are the commonest cause of loss of time through sickness, and the problem of reducing this wastage was one which appealed strongly to him. He therefore had constantly under review both the factors which facilitated the spread of infectious disease and those which militated against such spread.

He came to regard specific resistance as the most important limiting factor. He postulated that this resistance, which may be of any magnitude or duration, depends on the nature and amount of previous contact with the proteins of the parasite concerned. Such resistance, distributed throughout the population, constitutes ‘herd immunity’, the ratio of those having resistance above a certain magnitude—immunes—to those lacking this resistance—susceptibles—being the ‘herd immunity index’. He found that the spread of epidemics in space and time is a function of this index, combined with the density and movements of the herd. Unless the mass of the infective agent is sufficient to overcome this resistance, the parasite is destroyed by the host, whose resistance is thereby altered in degree. Time spent in an infective environment therefore plays a significant part in determining the resistance of the host. Dudley postulated a principle which he designated the ‘velocity of infection’, resulting from the interplay of the velocity at which the infective material is received by the host, the velocity at which it is destroyed by the host, and the velocity at which the host resistance alters in a positive or negative direction. On this ‘velocity of infection’ depends the final result of the reaction between the host and the invading organism. These and other hypotheses are supported by a mass of statistics drawn from a study of the incidence of sore throat, diphtheria, influenza, mumps, scarlet fever, rubella, and cerebro-spinal fever in varied communities such as the London Foundling Hospital, naval training establishments, and sea-going ships. In analyzing these figures, and in making his deductions therefrom, Dudley found full scope for his mathematical talent and for his lucid reasoning. The final dictum, made in his monograph on the spread of droplet infection in semi-isolated communities (1936) that ‘the chief practical lesson . . . is that the individuals
of a community should be isolated from each other to the greatest possible extent in their sleeping quarters. Especially is this the case in those communities to which many susceptibles are frequently added', is perhaps somewhat of an anticlimax, but shows a refreshing degree of realism.

Dudley's advocacy of the philosophical approach to the problems of epidemiology became even stronger in his later years, as can be seen in the titles of his two Presidential Addresses to the Section of Epidemiology and State Medicine of the Royal Society of Medicine—the first, in 1935, 'On the biological approach to the study of epidemiology' and the second, in 1936, 'The ecological outlook on epidemiology'. His basic theme throughout was the establishment of active immunity by latent infection, and his preoccupation a study of the factors, short of a clinical attack of the disease in question, which operated for or against the acquisition of this immunity. His breadth of vision and wisdom in these matters attracted attention far beyond the confines of his own service, and the principles he enunciated have found general acceptance.

Other scientific investigations

Dudley was fundamentally versatile, and was prepared to turn his attention to any subject which had a bearing on his central theme—the preservation of health in the personnel of the Royal Navy. Thus we find papers on the use of the kata-thermometer in the tropics, atmospheric hazards of one kind and another in ships, mass radiography, the danger of introducing yellow fever into India, and various other subjects, unrelated to each other except that they fall within the province of the naval sanitarian. The volume and scope of his writings give ample evidence of the opportunities which present themselves to the Service medical officer who is gifted with the ability to see and to grasp them.

Administrative Appointments

It is rare for a scientist in any of the medical services to escape administrative appointments in his later years—appointments which leave him little if any time to devote to his specialty—and Dudley was no exception. He was made Deputy Medical Director-General in 1936, and in 1941 became Director-General, an appointment which he held until January 1946. It is a very remarkable fact that his colleagues at this time, the Director-General of the Army Medical Service and the Director-General of the Royal Air Force Medical Service, had both, like himself, been pathologists in their earlier years. There can be no doubt that their mutual interests and expert appreciation of the practical problems involved in the preservation of health in the services did much to ensure the acceptance of the principles which they jointly advocated.

Dudley's responsibilities as Medical Director-General were vast and varied. Although he had to plan the massive expansion of the Naval Medical Service
rendered necessary by the world-wide commitments of the Royal Navy and to make all arrangements for attending to the sick and wounded, his main interest was in the preservation of the health of naval personnel, and in this he was able to make practical application of his earlier studies. He held that the only way of ensuring the adoption of hygienic measures was to explain them fully to the commanding officers of formations and others in authority, and thereafter to place the responsibility for implementing the instructions squarely on their shoulders. In carrying out this policy, his scientific reputation stood him in good stead, for he was much respected by his 'lay' colleagues, and was able to place his point of view before them in a forceful and convincing fashion. In his personal record he recalls with some glee an interview he had with Lord Louis Mountbatten, newly appointed Supreme Commander of South East Asia Command, whom he lectured on various basic principles of hygiene and in particular on the prevention of malaria, insisting that Mountbatten must appoint an antimalarial medical staff with the right of direct personal access to himself. Although Dudley was 'rebuked' for not having approached Mountbatten through the normal channels, he regarded this as being of little moment in comparison with the fact that his advice was adopted and his suggestions expeditiously carried out.

One of his most important achievements at this time was to persuade the Board of Admiralty to found the Naval Personnel Research Committee, with the Secretary of the Medical Research Council as Chairman, and, as members, non-medical naval officers in equal numbers with medical officers and civilian experts. The composition of this Committee, which Dudley arranged with the help of his friend, Sir Edward Mellanby, achieved his object. Previously, novel or revolutionary proposals put forward by the Medical Branch of the Royal Navy on its own authority were apt to be treated by the Lords of the Admiralty with the suspicion which the layman very often entertains towards such innovations. Coming from a predominantly civilian committee and with the concurrence of high-ranking non-medical naval officers, the position was very different, and proposals were accepted without delay or demur. This Committee still functions, and has been responsible for much good work.

Another achievement was the introduction of mass radiography in the Royal Navy. Dudley had long been interested in the possibilities of detecting at an early stage tubercular lesions in the lung, a condition of much potential danger when men have to live together in the close proximity which is unavoidable under Service conditions. His enthusiasm led to the development of this technique with such success that it was used in the Navy before it was adopted by any of the other services or on a national scale.

Although his colleagues suggested, somewhat ruefully, that Dudley placed medical administration on a much lower level than epidemiology, he was none the less a good administrator. He remained calm when chaos reigned, and in trying circumstances his decisions were sound, lucid and logical. The extent to which his ability was appreciated by his seniors is revealed by the
invitation given to him to extend the statutory period of his appointment and remain in office until the end of the war.

PERSONALITY AND PHILOSOPHY

Despite the fact that Dudley was endowed beyond the average with natural gifts, both physical and intellectual—and was not unaware of the fact—he had nevertheless an unusually shy and reserved disposition, so that in strange company he was monosyllabic and appeared to be aloof. When he was with friends, however, the shyness disappeared, and he talked freely and entertainingly, especially when the conversation turned in any way to work in which he was interested. In scientific meetings and committees he often showed the same aloofness, and in general he was much less apt with his tongue than with his pen. His silence was not an indication of lack of interest or of wandering attention, and his colleagues have remarked on his ability to write a brief yet brilliant summary with most pertinent comments on a discussion in which he took little or no part and in which he appeared to show little interest. As a young man he at first exhibited the same diffidence regarding his scientific work, but fortunately he was brought in contact with others who shared his interests and disagreed with his modesty. In the early 20’s he was invited by Sir Paul Fildes (who was pathologist at Haslar during the first war, and there made Dudley’s acquaintance) to read a paper before the Medical Research Club. There he came to the notice of Bullock, Topley, and Major Greenwood, who were quick to recognize the importance of his findings and who encouraged him to continue his research. The friendships thus started were life-long, and Dudley writes that he owes more than he can acknowledge to the guidance and help he received from these three men. Although he worked harmoniously with his naval colleagues and was much liked by them, Dudley was essentially an individualist. He considered himself too independent and lazy (this, however, sounds like one of the so-called ‘whimsies’ which he describes when he writes about psychology) to work under direction, and too diffident to direct a team of research workers, and preferred as far as possible to follow his own bent without direct assistance from others. His success as an investigator was probably due to his keenness and persistence, his capacity for taking pains, and the scrupulous honesty he exercised in interpreting his findings. His mathematical brain stood him in good stead in epidemiological work, though a critic might say that sometimes his enthusiasm outran his judgment. On more than one occasion he went to great trouble to construct a complex mathematical equation for the solution of a problem and then, as far as can be seen, passed on without using it in any practical way.

In his years of retirement Dudley wrote two books, The four pillars of wisdom and Our national ill health service. Of the second of these, little need be said. It is not so much an indictment of the existing National Health Service as a plea that more effort should be devoted to preserving the health of the healthy.
than to succouring the sick. *The four pillars of wisdom* is of greater interest in that much of it is autobiographical, an analysis of Dudley’s own philosophy. The four ‘pillars’ are semantics (the science of meanings), psychology, statistics and logic—in the last paragraph of the epilogue of the book he gives, as synonyms, perspicuity, human nature, a sense of proportion, and common-sense. In advocating the inclusion of these subjects in scientific curricula, he draws from his own experience to illustrate the disadvantages under which he laboured until he had, through his own efforts, acquired an adequate knowledge of them, and enlarges on the importance of having a fundamental grasp of these subjects in order to be able, in the course of scientific investigations, to separate facts from fancies. A chapter on religion and psychology tells much of the doubts and conflicts of loyalty which troubled his early years. Brought up in a strict religious atmosphere, he found himself unable to accept the teaching of his parents and instructors; and, having while still a schoolboy studied Darwin, Haeckel, Spencer, and Grant Allen, he turned to agnosticism with, he says, great mental relief and freedom, and was able ‘to become a normal member of the herd’. It is clear, however, that he never did become a normal member of the herd, and throughout his life the sceptical yet questing outlook which he evinced when breaking away from the religious teaching of his early years remained an integral part of his personality. He attributed great importance to ‘herd instinct’ and ‘herd fashion’ and was gravely suspicious of the intrusion of emotion into scientific argument and reasoning. Nevertheless he retained his sense of proportion. ‘Nothing is more irrational’, he wrote, ‘than to be always pedantically rational. But it would make the world easier to live in if people could truly believe that emotional values were not to be placed in the same category as objective facts’.

Dudley’s father feared that his son would waste his life if he entered the medical service of the Royal Navy. In 1950 the son was able to write—‘I can truly say that I would join the Royal Navy again and as a doctor, if I had my time over again. I have had a splendid life, playing, working, and lazing all over the world, meeting all sorts and conditions of men, and being a member of the finest herd in the world, the Royal Navy.’

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