

comment

“Covid-19 has put the NHS’s structural problems centre stage” **DAVID OLIVER**

“If only our leaders could just admit to their mistakes” **HELEN SALISBURY**

PLUS The pandemic proves racism is our “lane”; returning to “normal” work

TAKING STOCK Rammya Mathew

We must not be guided by bad science

Covid-19 has forced the scientific world to make a huge number of decisions in an unimaginably short time. In our haste to respond, bad science resurfaced and adversely influenced decision making, at both policy and practice level?

In the early stages of the pandemic we didn’t always separate anecdote from evidence. Concerns about NSAIDs spread quickly, and oral steroids were unnecessarily withheld from patients with asthma or chronic obstructive pulmonary disorder. Information now travels more quickly than ever, but reliable and false information both spread at pace, so we all need to judiciously appraise new information and not take what we read at face value. Many clinicians commented that messages forwarded on WhatsApp detailing one clinician’s experience had somehow superseded level 1 evidence. In hindsight, we should have waited cautiously for more evidence to inform whether a change in usual practice was warranted—and been less influenced by conjecture.

An example of bad science at policy level has been the interpretation of antigen and antibody test results. Despite scientists explaining the rationale for considering pre-test probability when interpreting reverse transcription polymerase chain reaction (RT-PCR) results, the NHS test and trace service continues to disregard this—and, as a result, is wrongly advising many infected patients they no longer need to self-isolate. Similarly, a positive antibody result is seemingly viewed as an immunity passport, even by healthcare professionals. Yet we don’t know whether this confers immunity or, if it does, how long for.

Finally, we risk misinterpreting association as causation. The OpenSAFELY and ISARIC datasets provide valuable insights into the risk factor profiles associated with poor outcomes in covid-19, but we must be careful not to interpret this as causality. Boris Johnson has committed to a “war on fat” as part of

the covid-19 strategy, in light of evidence suggesting that obesity is a key risk factor for poor outcomes. Any investment directed at targeting obesity is welcome, but it’s important to question the basis for this when we don’t know of any interventions that could feasibly reduce the prevalence of risk factors such as obesity during this pandemic. And we don’t know whether the risk of poor outcomes diminishes in line with an improvement in risk factor profile—making this yet another poorly thought out political decision.

The pandemic requires us to act decisively but, in the haste to do something, we shouldn’t forgo the basics. Clinicians and academics still need to scrutinise the quality of decision making around the pandemic. Our collective voices are needed to ensure we are indeed being “guided by the science” and that this isn’t just rhetoric used by politicians to defend their positions.

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WhatsApp messages detailing one clinician’s experience had somehow superseded level 1 evidence



We can't stop covid-19 without stopping racism

As Martin Luther King Jr said, "In the end, we will remember not the words of our enemies but the silence of our friends"

Doctors like us who have been working on the covid-19 response in the US have been told to "stay in our lane" as the murder of George Floyd has triggered the largest anti-racism movement since the 1990s. It is our lane. Racism has always been a public health problem. Racism kills our patients, our neighbours, our colleagues, our leaders.

A number of people who see the protests as possible drivers of more covid-19 cases have suggested that it's hypocritical of doctors to support anti-racism protestors now when weeks earlier they denounced large crowds because of the risk of spreading the virus.

Framing anti-racism protests against the control of covid-19 is a false dichotomy. Will crowds possibly lead to more covid-19 cases? Yes. But so will unabated racism.

The data tell part of the story.

Black patients who contract covid-19 are three times more likely to require admission to hospital because of disease severity. Counties with a large black population account for nearly 60% of US deaths, despite representing only 22% of counties. Black patients are less likely to be able to obtain

covid-19 tests in several major US cities. Many black patients have a lower chance of being put on a ventilator where resources are too limited to treat everyone, based on biased algorithms that account for comorbidities and life expectancy. For black patients, even the decision to wear a mask requires them to weigh the risk of being targeted or even killed by law enforcement against getting covid-19. Racism—the explicit and intentional oppression of people from ethnic minorities, not by accident, but by systematic intention for centuries and unabatedly into the present—is the underlying driver of why black patients are at the centre of the US covid-19 epidemic.

The time is now

As doctors, this is the time to speak up. This is not about politics. This is not about preserving the status quo or being afraid to ruffle feathers. This is about life and death. This is about the fact that in our country, a police officer felt he could put his knee on a black man's neck for 8 minutes and 46 seconds while being filmed.

Silence now is saying something. It is saying that the death of a black man at the hands of a brutal white police officer is still not enough for you to put your own skin in the game. We

This is not about preserving the status quo or being afraid to ruffle feathers. This is about life and death

are well aware that institutions suffer from racism. We acknowledge that every one of us holds implicit and explicit biases, and that we must take responsibility and do more to be better, more informed, and more aware as allies to our black community. But doing nothing, and staying silent, is unacceptable.

Many doctors and public health professionals have gained large platforms from the pandemic. It is imperative they now use those platforms to publicly denounce racism. Racism must be stopped because it is morally deplorable. Additionally, covid-19 cannot be prevented without tackling the underlying drivers of its spread, and racism is undoubtedly one of those in the US. The spread of this pandemic is dependent on the exploitation of our societal vulnerabilities and weaknesses—and stopping it demands that we all stand together against racism.

We urge all physicians and public health experts to take a firm stance against racism. We urge that we as a community use our understanding of the science and



"Returning to work" after the pandemic



Elective surgery in England has come to a halt. Theatres across the country have been turned into temporary intensive care units (ICUs) and trainee surgeons have been redeployed to emergency departments, ICUs, and medical wards. Consultant surgeons are limited to triaging outpatients and performing only emergency or cancer related operations.

As an ophthalmology trainee, I haven't performed cataract surgery for 12 weeks and have assisted in only a handful of oculoplastic cancer and emergency trauma cases. As the weeks roll on, there is growing concern among my colleagues and I about a return to operating after a prolonged absence.

To many trainees, this may not be an unfamiliar experience. To date, my eight years of ophthalmology training have included two sets of parental leave. Despite

Trainees and consultants have some anxieties about returning to operating

the support of my educational and clinical supervisors, this was a challenging time—largely because of the lack of an established pathway to follow for "reintroducing" me to training. Interestingly, I found it much more challenging the second time round; with more seniority came greater expectations, looming exams, and increasing demands at home.

Since my last parental leave, there have been improvements to the returnees' pathway. Health Education England has put significant funding into a supported return to training scheme. The way in which this funding is used, however, is decided at a deanery level, and the support available for varies greatly around the country.



transmission of covid-19 to protect those who choose to protest peacefully against racism by guiding them with the information necessary to minimise viral transmission.

Take down power structures

We urge our institutions to make every effort to ensure that our fight against racism within our own walls is transparent; that racist actions and words are seen, heard, and dismantled; that racist people are held to account; that efforts against racism are actively studied and taught as part of our lifelong learning in medicine; that power structures that are based on racist ideologies are taken down and replaced; that people from ethnic minorities are treated with the utmost respect, equity, and justice—including in their promotions to positions of leadership; and that patients from ethnic minorities are no longer killed by racism that has haunted medicine since its inception as a field.

There is so much work to be done.

Abraar Karan, internal medicine physician, Brigham and Women's Hospital, Boston, Massachusetts

Ingrid Katz, associate faculty director, Harvard Global Health Institute, Cambridge, Massachusetts

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Measures like these are very much welcomed, but the BMA acknowledges we still lack “a clear pathway back into medicine.” Three or four months isn't classified as a significant period of time out of practice, and during this pandemic surgeons have not been completely absent from the clinical environment. Yet trainees and consultants still have some anxieties about returning to operating when elective surgery resumes in the coming weeks.

This pandemic will leave a lasting legacy for the NHS. This is an excellent opportunity to emphasise the importance of practical and emotional support for those returning to work—whether that is because of parental leave, illness, or a pandemic.

Sarah Levy, specialty trainee year 6, South West Peninsula Deanery Twitter @sarahllevy_

ACUTE PERSPECTIVE David Oliver

Structural issues exposed by the crisis

There's been much to celebrate in the extraordinary response of NHS staff to covid-19. But the crisis has also brought to wider attention a host of structural problems that those in the know had already recognised. As we consider settling back into business as usual, it's important to focus on solutions.

Acres of newsprint have been devoted to the failure to enact pandemic preparedness after the 2016 Cygnus exercise. There's now a court challenge asking for the details to be released. Recommendations for testing, contact tracing, PPE, ventilators, and intensive care capacity were not heeded.

Even if we'd responded a few weeks earlier to WHO's declarations of a public health emergency and then a pandemic, those gaps in capacity and the ability to scale up quickly would always have been exposed. South East Asian nations and Germany already had the infrastructure, or flexible links with the biotechnology sector, to react more quickly.

In England, since the 2010 election we've also seen sustained cuts to funding of local government, the public health grant, budgets, and staffing, impairing local capacity to respond to a pandemic with case identification and contact tracing.

Arguably, Public Health England is now heavily centralised and has been too controlling, sometimes reactive and slow off the mark—for instance, over guidance on transfers from hospital to care homes or on PPE. Its credibility has been harmed by this and by seeming too close to politicians.

Staff who trained overseas have paid for their service in blood—look at the body count

Furthermore, England's hospital bed base is among the lowest per 1000 population among OECD nations, and hospitals were already running far too close to capacity. Social care has been subjected to a sustained attack on funding since 2010. The care home service has struggled for viability and funding. And home care has lacked staff, with immigration policy worsening the situation and around one in eight vacancies unfilled. We have no more care home places now than in 2010, and 400 000 fewer people receive home care.

Before we'd even heard of covid-19, the NHS was struggling with workforce shortages. One in eight nursing posts and one in 12 medical posts were unfilled. Burnout and attrition were becoming endemic. Community nurses and health visitors had suffered sustained cuts. Although a hostile immigration policy and an unsettling atmosphere from Brexit have deterred staff from coming to the UK, one in seven clinicians trained overseas. During the pandemic these staff have paid for their service in blood—look at the body count.

Despite the many success stories of the frontline NHS and social care pandemic response, so many of the problems we've witnessed have their roots in the structural problems that were hiding in plain sight. Covid-19 has put them centre stage, and once it's over they need to be tackled with sustained action, to avoid a repeat when pandemic time comes around again.

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Our leaders need to just say sorry

We're all human, and we all make mistakes. It's said that traditional Persian weavers introduced deliberate errors into their work, believing that it was blasphemous to strive for perfection, which was solely a property of the divine.

Doctors' errors are not deliberate, but they happen. We spend time helping students and trainees to find the courage and the right words to say to patients, "I'm sorry, I made a mistake" and to work with them to salvage the situation. We build systems with multiple checks so that, if one individual makes an error, someone else on the team will pick it up. I'm grateful to the local pharmacists who check my prescribing and pick up any mistakes before harm is done.

It's hard to admit to ourselves we've fallen short. We really want to live up to our self-image of competent, caring doctors who, although busy, are in control and on top of our work. It can be harder to admit to patients that something has gone wrong and that it's our fault. However, this is one of our professional obligations—the duty of candour.

Sweden's state epidemiologist, who has overseen the country's coronavirus response, last week admitted too many Swedes had died. He said that, if the government had known at the beginning of the pandemic what we know now, the strategy would have been different. When we compare our own political

leaders it's difficult not to be embarrassed. In the face of incontrovertible evidence in the form of mortality statistics, they persist in telling us that they did the right things, at the right time, according to the scientific advice.

On 3 June the UK recorded more covid-19 deaths than the whole of the EU combined. Although figures from the Office for National Statistics showed 39 000 new infections a week in England from 26 April to 30 May and the death rate is as high now as when the lockdown began, most of the measures to control infection have been thrown to the wind. By gathering in the House of Commons when they were perfectly able to work from home, MPs are leading by bad example, and the nation is following. This week I overheard a visitor to my surgery suggest that, "now that lockdown is over, the queues will be horrendous."

Four members of the government's scientific advisory committee have broken ranks, voicing concern that lifting restrictions too soon risks a second wave of infection. We desperately need honesty and humility from our leaders, but all we get is bluster, hubris, and massaged statistics. If they could just admit to their mistakes and acknowledge the dangerous mess we're in, we could perhaps find a way to the single digit death figures our neighbours have achieved.

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We desperately need honesty and humility from our government



LATEST PODCASTS



Testing times

With the huge focus on covid-19 testing in the media, how do GPs communicate the current uncertainties around it to patients? GP Jess Watson, who also researches the use of diagnostic tests in primary care, joins this episode of Deep Breath In to discuss interpreting the polymerase chain reaction test for covid-19:

"We need to be careful how we communicate with our patients right at the start when we're suggesting testing for them. What I would tend to say is no test is 100% accurate. With these particular tests, if we get a positive result, then that's a very strong result and we can be very confident that, yes, you do have covid-19. But what I'd say to a patient is if you get a negative result and you've got strongly suggestive symptoms, we need to take that negative result with a pinch of salt."

Counting the ways Donald Trump failed in this pandemic

US president Donald Trump has come under criticism from much of the public health community for the US's response to covid-19. How exactly was the response mismanaged and what allowed those mistakes to happen? This podcast hears from its guests for their answers, including Nicole Lurie, who was former assistant secretary for preparedness and response in the Department of Health and Human Services during the Obama administration.

"There was clearly a failure to act. Even in a federalist system, it is the responsibility of government to plan for the worst and protect its citizens from the worst outcomes, and then you can scale back from there. But this government really failed to plan for the worst and protect its citizens from the worst outcomes—by getting started late, and then by being so disorganised in most aspects of what it's done."



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LETTERS Selected from rapid responses on bmj.com

LETTER OF THE WEEK

Hard choices in public health

As covid-19 mortality grows, the global effects of “lockdown”—from mass unemployment to threatened famine—become increasingly stark (Editor’s choice, 9 May). The phrase “but it has to be done” is threatening decades of norms on human rights by focusing whole countries, the world, on one problem and one outcome.

Dispassionate discussion of covid-19 is difficult, but we owe the public the right to information provided calmly, honestly, and with context. Data indicate that covid-19 mortality is well below 0.5% and death is rare in people under 40. In the US, total mortality of covid-19 is 16% that of cancer. Globally, it’s 20% of tuberculosis. Do the public grasp this when hearing the terms “rampaging” and “catastrophe”? Would they react to 1 in 1800 people, predominantly unwell and elderly people, dying in the UK as they do to 36 000 deaths?

Decision makers are damned if they do and damned if they don’t. Good public health approaches include the public in decision making by providing facts. Pushing millions of young people into unemployment and delaying evidence based health checks will substantially reduce life expectancy. “Waiting for the global vaccine” will increase famine and child mortality. These life years lost will dwarf those of covid-19. No legitimate covid-19 response can ignore this.

To ensure that the public health values we hold dear are maintained, we could insist on always giving numbers in context; ensure that modelling always includes all costs; and avoid the demonstrably false premise that this is about lives versus money. Money saves lives.

Politics and name calling are the people’s prerogative. We should inform them. Even though they might disagree with us. We have lives to save, economies to support, and democracies to nurture. That was, and is, public health.

David Bell, independent consultant, Issaquah

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Clinicians have stepped up superbly and courageously

COVID-19: ROAD TO RECOVERY

“All changed, changed utterly”

Godlee discusses the long road ahead after covid-19 (Editor’s choice, 9 May). Is this an opportunity to reimagine healthcare and forge a “new normal” for medicine?

After an extraordinary few weeks, WB Yeats’s line comes to mind: “All changed, changed utterly.” Normally complex changes such as virtual care and major service reconfigurations have occurred at breathtaking pace. Traditional barriers and institutional inertia were overcome. We have witnessed unparalleled levels of clinical leadership, motivation, collaboration, and a “can do” culture. Can we use this momentum to shape the post-covid-19 world?

There have been major concerns that we must learn from—the large number of deaths, the experience of care homes, and problems with the supply of personal protective equipment. Covid-19 has been a call to action to clinicians, and they have stepped up superbly and courageously. Clinicians now feel empowered to make changes. Let us not lose this.

Mayur Lakhani, GP principal, Loughborough; Sonam Lakhani, GP trainee, Barnet; Priyanka Lakhani, core medical trainee, Harrow

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COVID-19 AND ETHNICITY

A biological basis for ethnic disparity?

Kar postulates that patients from ethnic minorities with covid-19 might not receive the same level of care as the rest of the population (Partha Kar, 9 May). My experience on secondment does not reflect this.

Most patients I cared for were from black, Asian, or minority ethnic (BAME) backgrounds. We provided the highest possible quality of care to these patients, including prolonged use of extracorporeal membrane oxygenation. Many are now in the recovery phase. At no point was patient ethnicity a perceivable barrier to treatment.

SARS-CoV-2 infects its host through the angiotensin converting enzyme 2 receptor. The differing responses of BAME people to treatment with angiotensin 2 receptor antagonists indicates a possible biological basis for the different infection rates.

I’m not naive enough to think that there is no possibility of racism in the NHS, but it is too early to point to healthcare provider attitudes as a cause of disparity.

Anthony D Dimarco, clinical fellow in inherited cardiovascular disease, London

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FACE MASKS FOR THE PUBLIC

Laying straw men to rest

Our article on face masks has already been cited 60 times and has an Altmetric score of over 3000 (Analysis 25 April). Our argument for applying the precautionary principle seems to have drawn sympathy from scientists and clinicians.

More empirical studies have been published that support the efficacy or confirm the lack of serious harms associated with the lay public wearing face masks. To my knowledge, no robust study has been published showing that the harms of mask wearing outweigh the benefits.

The arguments in Martin and colleague’s letter (30 May) are essentially straw men propped up by selective citation. I have addressed them in an open access, peer reviewed paper, with 89 references, published in the *Journal of Evaluation in Clinical Practice*. Martin and colleagues were aware of that paper—a preprint was published weeks ago, and they corresponded with me on social media.

Trisha Greenhalgh, professor of primary care health sciences, Oxford

Cite this as: [BMJ 2020;369:m2240](#)



OBITUARIES

Shyam Pratab Singh

Consultant cardiologist (b 1932; q Lucknow 1955; FRCP), died from heart failure on 10 March 2020



Shyam Pratab Singh moved to England soon after qualifying to pursue a career in medicine and paediatric cardiology. He was appointed consultant at Birmingham Children's Hospital and Dudley Road (now City) Hospital Birmingham in 1967. He undertook sabbaticals at Massachusetts General Hospital and the Mayo Clinic in the US, and the Karolinska Institute in Sweden, where he learnt new techniques in invasive cardiology. He was known as an excellent physician and a genuinely kind man with an encyclopaedic knowledge of cardiology, a steady list of publications, and a passion for cricket. He leaves his wife, Indra, and three children by his first marriage.

Gareth Beevers

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Sara Lilian MacRae

Long lapsed psychiatry trainee Edinburgh (b 1964; q Aberdeen 1990), took her own life on 17 March 2020



Sara Lilian MacRae had just started her psychiatric training, when her career was interrupted by the first of several episodes of psychosis, and, although she always hoped to return to her chosen specialty, she had to find other ways to help people with mental illness. She fought her disease with a tenacity that was often heart wrenching but fuelled by penetrating insight into the organic nature of so much of what she experienced. Sara found great peace in her remarkable artistic skill and in raising her son as a single mother. She railed against the stigma that mental illness brings, not to her as much as to those she met through her experiences of psychiatry from both practice and care. She leaves her son, Christopher; her mother; and five siblings.

Calum A MacRae

Cite this as: *BMJ* 2020;369:m1737

Lloyd Meynell Norburn

Consultant obstetrician and gynaecologist Preston and Chorley Hospitals (b 1924; q Manchester 1947; MD, FRCOG), died from old age on 21 March 2020



Lloyd Meynell Norburn gained a scholarship to Manchester Grammar School. He injured his arm in a mountaineering fall and was deemed unfit for national service, and so completed his medical school training in Manchester. He undertook further training in Edinburgh, and subsequently Blackburn where he met his future wife, Ruth. He was a registrar in Northampton and senior registrar in Oxford, before being appointed as a consultant in Preston and Chorley in 1962. He completed his MD in hypertension in pregnancy in 1964. Lloyd had many years of retirement in Devon, where he enjoyed walking, reading, plant collecting, and tending to his beloved garden. He leaves Ruth, his wife of 65 years; two children; three granddaughters; and great grandchildren.

Peter Norburn, Susan Rowland

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Keith Raymond Ross

Consultant paediatrician (b 1946; q Manchester 1968; FRCP), died from lung cancer on 21 April 2020



Keith Raymond Ross was consultant general paediatrician and neonatologist in Wolverhampton from 1975 to 2003. On being appointed he brought with him technical skills in the fledgling specialty of neonatology. Keith introduced mechanical ventilation and innovative protocols that substantially improved outcomes. He helped guide the local service to become a subregional neonatal intensive care unit from the early 1980s and was one of the early champions of neonatal nurse practitioners. An astute and able general paediatrician, he was coauthor of *Frozen Awareness*, describing in diagrams the most common forms of child abuse, which was becoming increasingly recognised as a problem in his early years of practice. His cancer was relatively advanced when found. He leaves his wife, Sandra; two children; and five grandchildren.

Deepak Kalra, Janet Anderson

Cite this as: *BMJ* 2020;369:m1739

Mary Glover

Former community medical officer for north Worcestershire (b 1927; q Birmingham 1950), died after a major stroke on 19 April 2020



Mary Cooksey married a fellow medical student, Roy "Cherry" Glover, in 1951. Professionally Mary worked part time, doing mainly locums, while bringing up three sons. For many years she was a clinical research assistant at the Women's Hospital, Birmingham, in particular following up patients who had undergone cone biopsy of the cervix, the results of which were published. Subsequently Mary trained as a community medical officer. She worked in north Worcestershire, assessing the schooling needs of disabled children. She retired on her 60th birthday. Roy also retired from his general practice shortly afterwards. For many years they enjoyed an active retirement, playing golf and travelling. Predeceased by Roy in 2009, Mary leaves three sons; six granddaughters; and five great grandchildren.

David Glover

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John Stuart Whittaker

Consultant histopathologist (b 1933; q Manchester 1957; FRCPath), died from covid-19 on 8 April 2020



John Stuart Whittaker was appointed as a consultant histopathologist at Withington Hospital in 1970. He rapidly developed a name for himself as a good diagnostician, his main interest being tumours of the salivary glands. He developed a referral practice throughout the region and further afield. He moved some sessions to Christie Hospital, which reviewed all the histopathology tumour diagnoses in the region, before chemotherapy or radiotherapy. Stuart moved all of his sessions to Wythenshawe Hospital, where he stayed until retirement in 1993. Throughout his life he was approachable to consultant colleagues as well as junior staff. He published 23 papers. Outside the hospital, apart from family, he loved singing in the Halle Choir. He leaves his wife, Dorothy; four children; and six grandchildren.

Philip Hasleton

Cite this as: *BMJ* 2020;369:m1741

OBITUARIES

William Brumfitt

Pioneer of modern microbiology

William Brumfitt (b 1927; q St Mary's Hospital Medical School, London, 1951; MD, PhD, FRCP, FRCPath), died from the effects of cerebrovascular disease on 8 February 2020

After qualifying, William Brumfitt did his national service, during which he wrote his MD thesis on iron deficiency anaemia. His PhD topic, researched in Alexander Fleming's laboratory in the Wright-Fleming Institute, was a study of aspects of lysozyme.

Golden age of antibiotics

He was appointed senior lecturer and honorary consultant at St Mary's Hospital in London at the early age of 29. His appointment as consultant in bacteriology at Edgware General Hospital in the early 1960s coincided with the start of what has been called "the

golden age of antibiotics," when numerous new antimicrobial compounds were introduced. At Edgware he set up a walk-in clinic for the study of urinary tract infections and started to conduct clinical trials with new antibiotics.

Urinary tract infections remained of great interest to him for the rest of his career. His friend and colleague Jeremy Hamilton-Miller, with whom he worked for more than 30 years, says, "His laboratory attracted many young microbiologists who, under his tutelage, went on to become respected consultants in the UK and Europe. The results of his clinical trials have provided a rich vein of research and medical advancement that has stood the test of time."

In 1970 Brumfitt was appointed foundation professor of pathology at Southampton Medical School,

but this did not turn out as he wished, and after a year he moved to his final appointment, as professor of medical microbiology at the Royal Free Hospital School of Medicine. There, at the old Gray's Inn Road site, he found a somewhat run-down department in an increasingly dilapidated building. When it moved two years later to the new Royal Free Hospital in Hampstead it was possible to engage further staff.

Those who passed through Brumfitt's department benefited greatly from the expertise of the practice and the teamwork and derived enjoyment and fulfilment from this work, as well as advancing their own careers. He greatly enjoyed seeing patients. In addition to his research and excellent clinical care he presided over a very high standard of teaching at all levels.

Hamilton-Miller recalls, "The bulk of his many publications (over 400 in total) included trials of novel penicillins and cephalosporins as they came on stream, in urinary infections, both acute and chronic, as well as the pathogenesis of such infections. There were also laboratory, pharmacokinetic, and clinical studies on many other antibiotics, including trimethoprim (alone and in combinations), rifampicin, fluoroquinolones, and aminoglycosides.

"There were also investigations of antibiotics in liver disease and renal dialysis. There was pioneering work on antibiotic synergy, in the use of rifampicin in non-tuberculous infections and on MRSA [meticillin resistant *Staphylococcus aureus*]. In addition, there was a stream of authoritative and critical reviews on many microbiological topics."

He adds, "Bill had very good connections with several international drug companies, and as a result we often had early access to new compounds. Meanwhile—as in Edgware—registrars were actively engaged

in the day-to-day business of the walk-in clinic. The outpatient clinic on Tuesdays was preceded by a clinical meeting, where problems were discussed."

Walk-in clinics

Brumfitt's friend Alasdair Geddes remembers, "Bill was a pioneer of modern clinical microbiology and was responsible for training a generation of microbiologists, many of whom subsequently occupied senior posts in academic departments around the country. He was a highly intelligent and complex character. His greatest achievement was setting up—first at Edgware, then on a larger scale at the Royal Free Hospital—walk-in clinics for urinary infections."

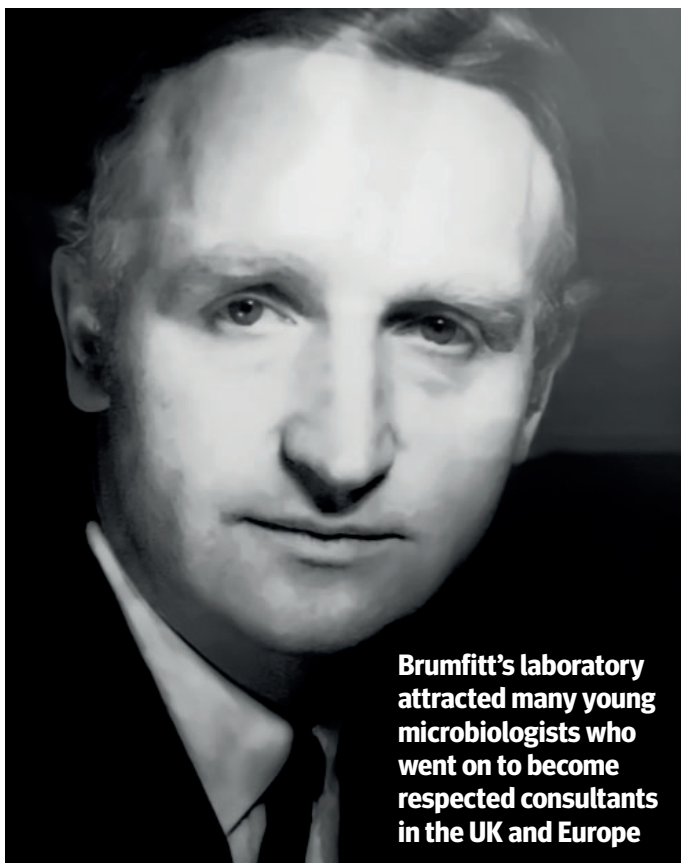
Hamilton-Miller says, "Bill was always very smartly turned out and took great pride in showing me how well cut his suits were and how his shoes were hand made. He told me that he lined up all his shoes every weekend and polished them to a high gloss. He also collected ties. Despite obvious considerable attraction by the opposite sex, he resisted all temptations and indeed confided to me once that he was too busy to get married."

Bill was a founder member and president of the British Society for Antimicrobial Chemotherapy from 1971 to 1975 and of the Ninth International Congress of Chemotherapy in London in 1975. In 1966 he was visiting professor at New York University Medical School. He was a founder member of the College of Pathologists (later the Royal College) in 1964, and in 1971 he received the Lettsomian medal of the Medical Society of London. He was awarded the Garrod medal of the British Society for Antimicrobial Chemotherapy in 1989.

He leaves two nieces.

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Brumfitt's laboratory attracted many young microbiologists who went on to become respected consultants in the UK and Europe