Revisionism has hardly touched Florence Nightingale, and she remains one of the great icons of the Victorian age. Despite some hostile comment, in particular from F B Smith, the popular image of her remains that of the angel of Scutari and the genius behind much medical reform and the development of nursing. However, an examination of primary sources shows that much of this reputation is based on the myths created by the popular press at the time of the Crimean war and subsequently by Cook’s biography of her. This was commissioned by Nightingale’s family after her death and can therefore hardly be regarded as unbiased.

The Nightingale myth was given a considerable boost by Woodham-Smith’s book, written in the aftermath of the second world war, a time when Britain desperately needed heroic figures. Indeed, such was the acclaim with which this book was greeted that Nightingale’s reputation was largely unimpeachable for the next few decades.

One reason this situation remained unchallenged is that historians generally have not undertaken the breadth of primary research necessary to objectively re-evaluate Nightingale’s work, her achievements, and her role in the movement for medical reform in the 19th century. This is particularly true with regard to military medicine, and it may fairly be argued that Nightingale, far from guiding the reform and development of military medicine, actually impeded its progress as a result of her class based hostility to military doctors.

Class wars
It is often forgotten, or overlooked, that Nightingale was born into a wealthy and well connected family. Indeed, at a time when influence was often determined by social standing, the Nightingales could exercise considerable influence. Lord Palmerston, who was prime minister during much of the Crimean war, was a close friend of the Nightingale family, his estate in Hampshire adjoining theirs. Such contacts were easily
extended, and in her 20s Nightingale formed a close friendship with Sidney Herbert, who later became secretary at war and her most important political patron.

As a member of the gentry class Nightingale was well versed in the philosophy of noblesse oblige—hence her sincere and deep felt care for common soldiers entering her hospitals in Scutari. But undoubtedly she also was a snob, displaying considerable resentment towards people, Crimean doctors in particular, who had dared to rise above their station. At the time, almost three quarters of military doctors were Scottish or Irish; many came from fairly modest or poor backgrounds, and they were often despised by the aristocratic or upper class English line officers. It was therefore easy for the likes of Lord Raglan, the commander in chief in the Crimea, to blame the medical officers for problems caused by his own staff when under attack by politicians in London.

Such class consciousness and social prejudice was fairly widespread, as illustrated by the post-war statement by Palmerston that the greatest deficiencies in the Crimea had been caused “where there were persons belonging to other classes of the community—in the Medical Department, the Commissariat Department, the Transport Service, which have not been filled by the aristocracy or gentry.”

Nightingale seemed to have no hesitation in participating in the attacks on army doctors working in the Crimea and the army medical department in general. Indeed, she became noted for her exaggerated statements and vituperative asides in relation to the senior medical staff. She had a particular dislike of Andrew Smith, a doctor who rose from a lowly background (his father was a shepherd) to the position of director general of the army medical department, and John Hall, the principal medical officer in the Crimea. The former she referred to as “that old smoke-dried Dr Andrew Smith,” and when Hall was awarded a knighthood for his work in the Crimea, she scathingly remarked that in his case the letters KCB stood for “Knight of the Crimean Burial-grounds.”

She also promoted the damaging assertion that Hall had no adequate medical qualification, when in fact he was an FRCS, by examination, and had an MD from St Andrews. Hall regarded her as a spy for the politicians in London, and it is true that she sent Sidney Herbert lengthy observations on the Scutari doctors, wielding to advantage the power that political patronage had accorded her. The full extent of her vilification of those to whom she took a dislike or the extent to which she promoted the cause of her favourites can never be known since she destroyed many of her papers and letters relating to the period.

Media darling

The fame and influence Nightingale gained from the Crimean war would never have happened without the actions of the press. British troops did suffer hardships in the Crimea, but the extent of the problems of army maladministration and of the suffering of the troops during the first year of the war was greatly exaggerated, and often distorted, by a press seeking to extend its power and influence and increase readership. No previous war had been so extensively covered by the press, or in such a way, with sensationalist and scandalous stories fanning the flames of mass hysteria in Britain. It was this that provided the stimulus to action, and to obfuscation, both by a government that sought to placate its critics and assuage the public outcry and by individual politicians anxious to protect their reputations and careers.

Herbert’s recruitment of Nightingale and her nurses was merely one aspect of consequent government action. However, this highly visible exercise provided more benefit in terms of public relations than it did practical help. Nightingale took only 38 nurses to Scutari, where there were initially around 3200 patients. Each nurse thus had charge of 84 patients, making it inconceivable that more than a few patients could receive adequate attention. Within a few months the number of patients had risen to over 5000, but the number of nurses remained unchanged.

What Nightingale achieved at the hospitals at Scutari has been subject to some debate, and there is much evidence to suggest that she did more harm than good. However, the self-serving press created the angel myth that has dominated the popular view of her, and Nightingale may justly be heralded as the first media created celebrity, with all the accompanying trappings, including a devoted fan club as evidenced by the large number of fawning letters written to her at Scutari. Sentiments such as those expressed in a letter by “CR,” who confessed to be “one among the many who truly admires, thinks, dreams, and prays for your welfare,” cannot have failed to inflate her own ego and form the basis for her remark in 1856 that “the War Office cannot turn me out because the country is with me.”

Exposing the myths

From such a base it was but a short step to Nightingale setting herself up as an authority on, and major protagonist in, the reform of military medicine. The myths about her achievements have been repeated so often that they have attained the status of fact, but they are easily exploded by reference to archival material, particularly the reports of the various parliamentary committees and Royal Commissions of the time.

Many of the reforms in military medicine attributed to Nightingale’s influence had been long standing proposals, or had been mooted previously by others. One highly significant development was the establishment of the Medical Staff Corps in June 1855 as a direct response to the problems caused by the orderlies in the Scutari hospitals. Although the idea for this has been attributed to Nightingale in a letter to Sidney Herbert in January 1855, it had, in fact, been proposed earlier by Smith and agreed by the War Office the previous month.

Nightingale regarded the establishment of a medical statistical branch as one of her most important proposals adopted by the Royal Commission in 1857. But again Smith had proposed to the War Office in December 1855 that a board for medical statistics be established formally within his office, a function that it was already performing. Nightingale has also been credited with the idea of the need for an army medical school, but this is something that had been first proposed...
over 50 years previously, although she did have some influence on the running of the school once it was established. It is also of note that, contrary to popular belief, British military hospitals had employed female nurses at the beginning of the 19th century, long before Nightingale went to Scutari.12

While such myths are easily exposed, the limits of Nightingale’s influence at this time may be gauged more directly from her recorded failures, notably her attempts to stop the building of the new army hospital at Netley, near Southampton. The scheme had been instigated by Andrew Smith and was approved in January 1856 despite opposition from Nightingale and her supporters, who argued that the site was unsafe on sanitary grounds.10 In 1858, while Netley was in the process of construction, the Nightingale faction attempted to have it “finished as a barrack,”11 but this again proved futile, and Netley became a highly successful hospital, eventually closing in 1958. With the death of Herbert in 1861 Nightingale’s influence with the War Office waned, and henceforth she would focus her attention on sanitary reform.

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Who gives me five?

In most surveys quantitative data are gathered with questionnaires and interviews. A comparison of such self reported data with measured equivalents shows that people systematically underestimate or overestimate frequencies (cigarettes smoked daily, age of onset, time to pregnancy) or clinical parameters (height, weight, blood pressure), which may lead to misinterpretation of the association between self reported risk factors and related outcomes.1 2 Misreporting can occur because participants intentionally or unintentionally round figures to a preferred end digit. We analysed the preference for the end digits zero and five when reporting body height in a multinational survey of individuals aged 50 years and older who were not in institutions (12 nationally representative samples totalling 30 611 valid heights, see www.share-project.org).

When properly measured, around 10% of people have heights ending in each of the digits zero to nine.3 Accordingly, about 20% of participants could be expected to have heights ending with zero or five. As the figure shows, the reported proportion of the end digits zero or five was much higher (between 26% and 62%), suggesting that many people erroneously reported these end digits. Since height is overestimated in almost all cultures (with variable magnitude) people who round to zero and five probably overestimate rather than underestimate their height.1 3

The figure shows similarities between languages belonging to the same family. People speaking Germanic (and possibly Slavic) languages indicated the end digits zero or five consistently less frequently than did people speaking a Romance, Greek, or Semitic language. In a large and representative Swiss sample, people kept the end digit preference characteristic for their native language even when living in a region using a different language, suggesting that such preferences are inherent in culture.3 This hypothesis is supported by the analysis shown here. End digit preference may be rooted in early childhood, transmitted by language, and may persist throughout life. Cultural preferences for rounding numbers could mask or exaggerate real differences between populations and could also explain why differences between measured and self reported estimates vary between cultures.1 3

To validly account for such bias and to tap the full potential for detection of data fabrication, preferences for reporting end digits should be assessed in different cultures and be compared with measured data in the same individuals.4 This approach might be particularly important when analysing trends in countries with high levels of immigration from different cultures or when threshold values affect decisions about treatment (for example, in management of hypertension).5 Since cultural patterns of rounding seem to be very consistent and specific, they could also be used to estimate the cultural homogeneity of a population or the representativeness of a mixed, multilingual population.

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2 Chioro A, Peytronyman-Bideauv I, Paccaud F. Associations between obesity and health conditions may be overestimated if self-reported body mass index is used. Obes Rev 2007;8:373-4.

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Auntibiotics

Gilbert Shama considers the BBC’s dissemination of the news about penicillin during the second world war

Fleming published his seminal paper on penicillin in 1929, but the transformation of penicillin into a useful therapeutic agent was to take its virtual rediscovery, some 10 years later, by Howard Florey and his coworkers at Oxford University. The story that followed Florey’s entry into the picture was a compelling race against time. Additionally it had the obvious propaganda value of what was, initially, a British success story at a time when there was little good news from the war front. The role of the BBC in disseminating this story has hitherto been overlooked, and the records, though fragmentary in places, add a new dimension to the early history of penicillin.

Broadcasts in English
The first BBC radio broadcast dealing specifically with penicillin was transmitted on 4 September 1942 in a programme entitled Ariel in Wartime. The broadcast explained in quite conventional terms what penicillin was, how it was produced, and its potency against bacterial pathogens, but the associated correspondence—unfortunately incomplete—makes for more interesting reading. An internal BBC memo of 1 September said: “There is a good deal of disputed priority involved, the point being that Wright’s nominee, Professor Fleming, made the discovery but never followed it up and the actual work has all been done by the Professor of Pathology at Oxford with the help and direction of the MRC [Medical Research Council]”—which all reads very much like a justification for crediting Florey. The “disputed priority” was being played out in the letters pages of the Times. A leading article on penicillin had appeared on 27 August and Sir Almroth Wright (Fleming’s boss) saw an opportunity to gain publicity for St Mary’s, and wrote a letter that was published on 1 September. In it Wright suggested that the “laurel wreath [for the discovery of penicillin] . . . should be decreed to Professor A Fleming.”

Sir Robert Robinson, Waynflete professor of chemistry at Oxford University, was equally determined that the work done at Oxford should not go unrecognised. His letter published a day later suggested that “a bouquet at least and a handsome one, should be presented to Professor H W Florey” for separating “therapeutic penicillin” from the complex mixture in which it was produced—something that Fleming had failed to achieve.

The preserved script of the broadcast bears exquisite testament to this unfolding rivalry. The typed lines “Professor Florey, Dr Chain and their colleagues at Oxford, aided by grants from the Medical Research Council and the Rockefeller Foundation have made an intensive study of penicillin” have been scored out in pen, in a move that smacks of a last minute intervention to ensure that the sole name associated with penicillin was that of Alexander Fleming, and that only the laurel wreath, and not the bouquet, was ultimately to be presented. The less contentious interpretation is that the deletion was part of the normal editing process—transmissions were, after all, subject to strict time constraints. But if this were the case, then why those lines in particular and not those dealing with the more technical aspects of penicillin’s action?

A further programme on penicillin was broadcast less than two months later as part of the series Marching On. This transmission took the form of a re-enactment. Early on the “Prof” (ie, Fleming) is made to exclaim “I say, Jones, something’s gone wrong with this culture. Just look at this Petri dish.” Then comes the critical moment: “Just like Newton and his apple and James Watt and the lid of his mother’s kettle, when world discoveries are hanging in the balance.” But there were problems; penicillin was difficult to make and it “kept badly,” and for those reasons nothing more was heard of it until war came. The scene then shifts to a committee meeting at the MRC, which eventually concluded that “elaborate apparatus and a skilled team of biochemists” would be required to “investigate” penicillin and that one “can’t expect a medical school to undertake this sort of work.” The chairman wants to know who could. The answer is obvious: “I should suggest Oxford, sir.”

The copy of the script from the Florey archives contains notes in the margins made presumably by Florey himself, such as “not done by Fleming but by Oxford team.” Florey wrote angrily to the BBC. Had the BBC considered whether it was in the public interest to
“call attention to a substance of therapeutic value which is unprocured except in minute amounts” and that this type of publicity had resulted in “a flood of pathetic letters from as far away as Western Australia and Saskatchewan”? Later he comes to the real point. “I am not concerned with the impersonation of Professor Fleming . . . But I wish to assure you that the whole passage about the MRC is a pure invention.” He refrains, evidently with difficulty, from pointing out “other gross inaccuracies.”

Questions were demanded at the BBC, as an internal memo from a beleaguered employee, dated 4 November 1942, shows: “Mr Johnstone Abraham the well known Harley Street surgeon undertook to write this script . . . as he was familiar with the subject and friendly with the discoverer of penicillin, Dr Alexander Fleming. He obtained all the material from this script from Dr Fleming himself and later Dr Fleming read the script and agreed to its being broadcast . . . He also explained . . . that while the research group working at Oxford had done an enormous amount of work in confirming Dr Fleming’s discovery and purifying penicillin, the story was of Fleming’s own discovery and who should know more of this subject than Dr Fleming himself.”

A week later Cecil Graves, the joint director general, wrote to Florey coolly informing him that “it was felt that in dealing with the story of the discovery of penicillin we could safely rely on the authoritative guidance of Dr Fleming.” If the broadcast made on 20 December 1943 by Howard Florey himself was an attempt to restore the balance, it was a long time in coming. Florey could hardly avoid mentioning Fleming’s “important observation,” but chose to commence his broadcast with reference to Pasteur who “discovered more than 60 years ago that certain micro-organisms . . . can produce something that will stop the growth of other germs.”

Fleming has been criticised for failing to recognise penicillin’s clinical potential, but Florey makes specific mention in his broadcast to the fact that Fleming had used dressings impregnated with crude penicillin. Fleming himself made a radio broadcast on 7 April 1944. The broadcast is remarkable for two things. The first is its opening statement: “Moulds are allotted by botanists a very humble place in the vegetable kingdom”—a statement that presaged the elevation not only of a particular humble mould but also of Fleming himself. Fleming was at the time on the threshold of scientific stardom. In May 1944 his portrait would appear on the front cover of Time magazine. The second interesting feature is that neither Florey nor the group at Oxford receives a single mention. Instead, an abstract reference is made to the combined efforts of the mould and “the skilled chemist” in bringing penicillin to humanity.

**European service broadcasts**

Although the belligerents on both sides during the second world war took extensive steps to obtain and disseminate scientific publications produced by their enemies, scientists in occupied Europe were essentially starved of access to material from the UK and US. News about penicillin did, none the less, reach them. One possible source was the mould culture collection in Baarn, the Netherlands, to which a number of German agencies addressed themselves, beginning in the autumn of 1942, with demands for cultures of *Penicillium notatum.* Smuggled copies of journals from neutral countries also provided information and there is even an incident of leaflets dropped by the Royal Air Force that describe penicillin. Added to these sources of information were foreign language broadcasts of the BBC.

Bernard Sureau of the Pasteur Institute has left an account of an attempt, centred on the institute, to produce penicillin. He attributes the beginning of their programme to a BBC transmission made in autumn 1943. However, recent evidence suggests that the work at the institute seems to have started before this time. None the less, a broadcast was made on 29 September 1943, and it could well be the one that Sureau had in mind.

In contrast to broadcasts made in English, this particular transmission was clearly aimed at medical professionals. It was evidently not the first such broadcast, for it begins: “We have on a number of previous occasions spoken about penicillin.” It goes on to quote from recently published US work and cites survival statistics in comparing penicillin with traditional treatments based on serum. Ultimately the
researchers at the Pasteur Institute only succeeded in making small quantities of penicillin, even with industrial help. Broadcasts were also made in other languages, but unfortunately none of their scripts has survived. However, research in the company archives of Leo Pharmaceuticals of Copenhagen has shown that Professor K A Jensen of Copenhagen University heard a BBC Danish language broadcast and that this was instrumental in starting the small scale production of penicillin. In addition, research conducted into clandestine manufacture of antibiotics in the Netherlands shows that workers in Delft heard Dutch language transmissions on penicillin, from which they too were able to obtain useful information.3

And finally

BBC radio broadcasts contained a reasonably high level of technical information, and from the physical evidence of the scripts themselves seem not to have incurred the intervention of the censors. Press reports of the time were sometimes irresponsible in handling the matter of penicillin’s unavailability for civilian use. By contrast, the BBC was strenuous in its attempts to assuage the resultant public frustration. Even before Florey’s angry outburst, the corporation had begun to broadcast the message that penicillin would remain in short supply until it could be synthesised by chemists, and that until then its use would be restricted to military ones. It was then believed that manufacture of penicillin using mould would only ever provide a temporary solution to the problem of mass production.

The objectives of the European services’ broadcasts were completely different. In this case the transmissions were aimed largely at a medical audience and attempted to help them maintain their professionalism. In a few cases they may have supplied technical information to scientists in occupied Europe striving to produce penicillin.

**Do antibiotics and alcohol mix?**

Genitourinary medicine clinics often prescribe antibiotics and, except for metronidazole, do not advise abstinence from alcohol. However, patients often assume that they should avoid alcohol when taking any antibiotics. A Google search on “antibiotics and alcohol” finds many sites that advise abstinence.

But this belief has no foundation, and no contraindication is given in the British National Formulary.1 We wondered how prevalent this myth was and whether patients ever skipped antibiotics to drink alcohol. A pilot survey showed that 76% of clinic staff believed the myth.

We asked a convenience sample of patients attending our clinic to complete a questionnaire on this subject. Ethics approval was obtained for the survey.

The patients returned 337 of the 410 (82.2%) questionnaires; 56% of respondents were women, 44% men (2% not stated). Mean age was 28.9 years. Almost a half (49.3%) said they were white, 24.6% said they were black, 12.5% said they were of mixed or Asian ethnicity, and 13.6% did not answer. Over a half (51.6%) had been educated to university level or beyond. Most (71.8%) believed that drinking alcohol while taking antibiotics would make them ill. Furthermore, 81% believed that alcohol might stop the antibiotic working properly.

Younger respondents were more likely to believe that drinking alcohol would make them ill (P=0.0013). Over three quarters of respondents said they didn’t drink alcohol if taking antibiotics. Only six (2.8%) admitted to having skipped a dose to have a drink. We found no correlation between level of education and beliefs held.

Although this study was conducted in a genitourinary medicine clinic, the questions related to antibiotic use in general, and the results show that belief in the myth is widespread. Fortunately, it seldom led to non-adherence to treatment—the myth was usually ignored or led to abstention from alcohol while taking antibiotics. Prohibition of alcohol use in people being treated for a sexually transmitted disease is a recognised historical fact and may have punitive origins.2 However, one of us (JSB) heard the following explanation for the myth from the late Brigadier Sir Ian Fraser.3 In the second world war, penicillin was being trialled for infected gunshot and shrapnel wounds. Because it was in short supply, it had to be recovered from the urine of recipients for reuse later. Many soldiers convalescing in field hospitals were allowed beer as a comfort. This increased the volume of urine and made the process of recovering penicillin lengthier, so the commanding officer banned these troops from drinking beer, and this led to the belief that alcohol should not be consumed with antibiotics.

We would be interested to hear evidence to corroborate or refute this explanation.

**Patients’ answers to questions. Values are number (%) of patients giving that answer (n=337)**

<table>
<thead>
<tr>
<th>Question</th>
<th>True (n)</th>
<th>Partly true (n)</th>
<th>Not true (n)</th>
<th>Not answered (n)</th>
</tr>
</thead>
<tbody>
<tr>
<td>Drinking while taking antibiotics* will make you ill</td>
<td>104 (30.9)</td>
<td>138 (40.9)</td>
<td>73 (21.7)</td>
<td>22 (6.5)</td>
</tr>
<tr>
<td>Alcohol will prevent treatment from working</td>
<td>168 (49.9)</td>
<td>105 (31.2)</td>
<td>38 (11.3)</td>
<td>26 (7.7)</td>
</tr>
</tbody>
</table>

*Excluding metronidazole.

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Churchill’s flu poem

Angus Nicoll and colleagues unearth the young Churchill’s poem about the 1890-1 pandemic

The Winston Churchill Museum contains a poem on the Russian flu pandemic of the 1890s written by Churchill when age 15, towards the end of his school days at Harrow. That poem is reproduced below, and it records features probably common to all pandemics. Firstly, that the virulence of infection usually diminishes with time and extension of a pandemic:

“Yet Father Neptune strove right well
To moderate this plague of Hell,
And thwart it in its course;
And though it passed the streak of brine [the English Channel]
And penetrated this thin line,
It came with broken force.”

Secondly, that the intensity of transmission often falls in late spring and summer:

“For though it ravaged far and wide
Both village, town and countryside,
Its power to kill was o’er;
And with the favouring winds of Spring
(Blest is the time of which I sing)
It left our native shore.”

The 1890-1 pandemic was perhaps the sixth pandemic of that century and certainly the best described. Its clinical and epidemiological features are typical of influenza type A. It was first described in Central Russia and then spread to Europe, but it may have arisen in China and southeast Asia (now thought to be the origin of new influenza A viruses). Different flu pandemics have distinct features in terms of severity, who they affect, clinical spectrum, and which groups account for most transmission—one reason why they are so difficult to plan for.

The 1890 pandemic had a much lower observed case-fatality rate than that of the 1918-9 Spanish flu. Many died though, because of an overall high attack rate and the inability of medical services to treat primary or secondary infections. The high mortality interrupted the decline in deaths from communicable diseases caused by improved sanitation and living standards in the later 19th century.

Although the 1890-1 pandemic was only mild to moderate in severity, mass sickness disrupted core services and the UK economy. Postal communications stopped for weeks and railway services were interrupted. Command and control mechanisms were impaired. In 1890 the prime minister was incapacitated for several weeks, and in 1891 committee work in parliament had to stop.

The 1890s event shows what can happen when preparations for pandemic flu are inadequate.

The Influenza

Oh how shall I its deeds recount
Or measure the untold amount
Of ills that it has done?
From China’s bright celestial land
E’en to Arabia’s thirsty sand
It journeyed with the sun.

O’er miles of bleak Siberia’s plains
Where Russian exiles toil in chains
It moved with noiseless tread;
And as it slowly glided by
There followed it across the sky
The spirits of the dead.

The Ural peaks by it were scaled
And never stay nor rest.
And with the favouring winds of Spring
(Blest is the time of which I sing)
It left our native shore.”

In Calais port the illness stays,
In many a Gaelic breast,
The cause of bitterness and pain
And never stay nor rest.
And now Europa groans aloud,
And ‘neath the heavy thunder-cloud
Hushed is both song and dance;
The germs of illness wend their way
To moderate this plague of Hell,
And thwart it in its course;
And though it passed the streak of brine
And penetrated this thin line,
It came with broken force.

And though it ravaged far and wide
Both village, town and countryside,
Its power to kill was o’er;
And with the favouring winds of Spring
(Blest is the time of which I sing)
It left our native shore.”