are the biggest problem in guerilla warfare and at one time we were carrying so many wounded on stretchers, with two men carrying, that there were few left to fight.

Food was very scarce; we seemed to live on boiled billy goat—which tastes as the billy goat smells—and a rock hard maize bread “chicken mash,” equally unpalatable. Vegetables were never seen. Later we could get sheep milk yogurt and in the early summer wild strawberries, unbelievably delicious after our winter fare. At one stage I heard food had been dropped. I sent a young Partisan, who two days later proudly walked in carrying a 28 pound tin of soya link sausages. My chagrin will be appreciated by those old enough to have eaten them during the war.

Historical background

Although the peoples of Yugoslavia all speak Serbo-Croat and are southern Slavs, originally of different “tribes,” who migrated there centuries ago, what is happening today has been the pattern for centuries. There has been persecution and bloodshed throughout their history. This is now based on petty nationalism and religious and cultural differences, as the north was occupied by the Austro-hungarian empire, which was Roman Catholic, while the south and east were for many years under Turkish (Ottoman) rule. Many Christian Orthodox became Muslim during this period, which is why there are so many Muslims in Bosnia. Both empires were allies of the Germans in the first world war and obviously had to relinquish all control.

Yugoslavia as we knew it, became a federation of the six states, a creation of the Versailles treaty after the first world war. It was Serb dominated and before the war was a semifascist state with a Serbian monarch. When Germany invaded Yugoslavia in 1941 she was defeated within a few days; then came the invasion and defeat of Albania and Greece. Mihailovic, a right wing Serbian army officer, formed a Serbian guerilla force, the Cetniks, who were not very active and later collaborated with the Germans. Later in 1941 Russia was invaded, and Josip Broz, “Tito,” the leader of the illegal Yugoslav Communist Party, founded the Partisans, who quickly became very active over much of Yugoslavia. Slovenes, Croats, Bosnians, and many Serbs and Montenegrins fought together, as did Roman Catholics, Christian Orthodox, Muslims, and some Jews whose patriotic fervour overcame their dislike of the antireligious dogma of the Communists. After the war Yugoslavia was united, though there were many ethnic problems. When Tito died it fell apart.

The Partisan war was brutal, dirty, and destructive. In fighting against a common enemy for the first time all ethnic groups fought together, although there were many who collaborated with the Germans. The current war is even more tragic, brutal, and dirty—petty nationalism and religious and cultural differences are being ruthlessly exploited. Thousands of Partisans died, thousands were left crippled; one wonders what are their thoughts as war erupts around them once again.

Two nineteenth century surgeons

Peter F Jones

In June 1992 the Royal Infirmary of Aberdeen celebrated the 250th anniversary of its opening as a six bedded hospital for the poor. Just at the midpoint of its history, in 1867, Joseph Lister published his first papers on the antiseptic principle in the practice of surgery.¹ Pre-Listerian times were enlightened by some remarkable individuals, among whom we should include William Keith, who became surgeon to the infirmary in 1838. The man who succeeded Keith in 1870, Alexander Ogston, gave a vivid picture both of surgery before Lister and of his experiences as he applied Lister’s teaching,² so the lives of these two men encompass a remarkable period in surgical history.

By 1838 the Royal Infirmary had grown to contain 182 beds, but only one or two operations were performed each week, and the range was limited: amputations, cutting for stone, couching for cataract, and the occasional mastectomy. The population was growing as factories attracted workers from the countryside, and the infirmary was overcrowded. The new building, opened in 1840, contained a large operating theatre with tiered benches for students, lit only by a tall window. Today this space lies dusty, silent, and forgotten, and it is hard to imagine the smells and noise that would have assailed Keith’s terrified patients as they were carried into the bustling theatre, with the students talking and commanding their friends in the front row to remove their hats. Ogston recalled that “there was no appliance for washing the hands . . . at the foot of the coarse stained old operating table lay a wooden tray of sand smelling of cats. On a shelf lay the instruments, open for anyone to handle. Suture needles were stuck in a jam pot of rancid lard.”³ After 1847 many patients benefited from ether or chloroform anaesthesia but, when they left the theatre, the wards

FIG 1—William Keith (1803-1871), surgeon to the Royal Infirmary 1838-70. Reproduced by permission of Aberdeen Medico-Chirurgical Society

and corridors “stank with the mawkish manna-like odour of suppuration. Each stuffy ward was presided over by an old woman whose only qualification was her ability to make a poultice . . . not a single wound

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BMJ 1992;305:1546-8

FIG 2—Alexander Ogston (1844–1929)—surgeon 1870–98, regius professor of surgery 1882–1909. Photographed in his home in 1896

healed without festering.” To some extent these conditions mirrored everyday life. The Den Burn, which ran through the centre of Aberdeen, was described in 1864 as an elongated cesspool³; typhus was endemic in the city, and every croft was damp.

Facing lithotomy

William Keith (fig 1) was in some ways ahead of his time. He was an early practitioner of audit, publishing in 1844 detailed notes on every patient he had treated for stone in the bladder (and observing that it is easy to show good results if only selected cases are reported).⁴ Later in 1844 he described in detail his technique of perineal lithotomy.⁵ He was unusual in emphasising the importance of preoperative preparation, and his elderly patients received rest, good food, and “ample tea and thin gruel” for two to three weeks.

The fear of operation must have been great for Keith’s patients, who faced lithotomy aided only by a

lot of whisky and a prayer from Keith.⁷ The patient was firmly held in the lithotomy position by four assistants. The siting of the incision was vital because ‘a great and fatal difference of opinion exists,’ and the description by Sir Charles Bell is “calculated fearfully to mislead the young surgeon.” After many studies on cadavers, Keith described a safe approach to the bladder. Afterwards, when the patient’s “safety and progress rest, under God, on the surgeon’s skill [he must] keep everything right, which is easier and safer than having to set them right.” He reported 23 consecutive lithotomies, with two deaths, a remarkable record for that time.⁵

The surgery may have been skilful, but Ogston later reported that as students they were not well taught, and he spent a year in Vienna and Berlin before graduating in 1865. There he had made a special study of ophthalmic surgery, and in 1868, aged 24, he was appointed ophthalmologist to the infirmary (fig 2).

Avoiding sepsis

Practising in this field, Ogston must have seen some disasters from sepsis, so he would have been receptive to the news of Lister’s discoveries. In 1869 he visited the wards of Lister’s disciple, Hector Cameron, in Glasgow. Five minutes with Cameron “convinced me of the truth of the marvellous discovery. I was shown a knee joint which had been opened . . . the limb was perfectly well, the wound clean and healing. [I had] to think out what the great revelation implied in the future.”⁸ Ogston returned determined to apply Lister’s methods, but he faced opposition from colleagues and the managers, who objected to the cost of clean dressings for every patient. However, when Keith retired in 1870 Ogston was appointed assistant surgeon. Working with “a minute observance of Lister’s antiseptic precautions” he developed an interest in bone and joint surgery and devised an operation for genu valgum which became internationally recognised.⁶

Lister was uncertain about the role of germs in sepsis, but Ogston came to suspect that specific bacteria cause specific infections. One day in 1877 he drained an acute abscess and examined a smear of the pus under his microscope: “There were revealed to me tangles, tufts and chains of round organisms in great number.” With a grant from the BMA he bought apparatus, built a hut in his garden as a laboratory, and examined pus from 70 acute abscesses, seeing micrococci in all samples. Many were clustered like bunches of grapes and these he later named staphylococci. Subcutaneous injection of pus into a mouse produced an acute abscess, and sometimes septicaemia. He wondered whether a pure culture would produce the same result, but “cultivation of microorganisms was in its infancy: the device I fell on was to introduce the germs into newly laid eggs [incubate them] and transfer the colony until nothing could be found save micrococci alone. These pure cultures were injected subcutaneously into mice, with results that were absolutely conclusive.” Ogston had thus fulfilled for staphylococci the three postulates of Koch some four years before Koch published them. His colleagues received these results with incredulity, but when he addressed the German Surgical Society in Berlin in 1880 they were immediately accepted.⁸ After Ogston’s death in 1929 the obituary in the *Lancet* concluded that he was the pioneer who “correctly interpreted the exact aetiology of acute suppurative processes in man.”

Asepsis in operations

At first Lister and his followers relied heavily on antiseptics and the carbolic spray. Lister operated in a stained frock coat and did not scrub up; Ogston wore

FIG 3—An operation proceeding in 1890 in the surgical amphitheatre, under the dome of the 1840 building. The only illumination is from the north facing windows. The Lister spray is in operation in the lower right corner

ordinary clothes but did roll up his sleeves.¹⁰ By 1890 surgeons and assistants had progressed to freshly laundered gowns (fig 3), Lister had abandoned the spray, and aseptic techniques were being developed. When the new surgical block of the infirmary opened in 1892 the theatre contained a scrub up sink and instrument boiler, but it was still an amphitheatre and surgical lists could not start until the daily lecture to students had been delivered. In that year 12 laparotomies were performed; by 1909, as Ogston retired, 12 abdominal operations were performed each week, the theatres were already outdated, and a new stack of theatres was being planned, suited to aseptic techniques.

Between the retirement of Keith and of Ogston surgery had been transformed. Ogston was one of a remarkable group of surgeons on both sides of the Atlantic who recognised that Lister's legacy enabled

them to exploit the technical skills of their forebears in new fields. Ogston himself had also made a unique contribution to the scientific foundations of surgical practice.

- 1 Lister J. On the antiseptic principle in the practice of surgery. *Lancet* 1867;iii:353-6.
- 2 Ogston A. How antiseptic surgery came to Aberdeen. In: Ogston WH, ed. *Alexander Ogston, KCVO*. Aberdeen: University Press, 1943:93-7.
- 3 Mackenzie H. *The city of Aberdeen. Third statistical account of Scotland*. Edinburgh: Oliver and Boyd, 1953.
- 4 Keith W. Hospital statistics of stone in the bladder. *Edin Med Surg J* 1844;61:123-9.
- 5 Keith W. Practical observations on the lateral operation of lithotomy. *Edin Med Surg J* 1844;61:396-417.
- 6 Ogston A. The operative treatment of genu valgum. *Edin Med J* 1877;22:782-4.
- 7 Ogston A. The discovery of the germ of acute suppuration. In: Ogston WH, ed. *Alexander Ogston, KCVO*. Aberdeen: University Press, 1943:98-101.
- 8 Ogston A. Ueber Abscesse. *Arch/Klin Chir* 1880;25:588-600.
- 9 Bulloch W. Sir Alexander Ogston. *Lancet* 1929;i:309-10.
- 10 Fisher RB. *Joseph Lister, 1827-1912*. London: Macdonald and Janes, 1977.

Learning surgery in Paris

Ian Fraser

Over 60 years ago I attended a clinical course at the Hôpital Necker, the recognised leading genitourinary hospital in Paris. The fortnight cost £30 and consisted of lectures and operations. Each doctor attending had a cadaver allocated to him on which he could perform the operation that we had seen the masters doing the previous day. Of the 20 or 30 students only two were Britons, one from Glasgow and myself; the rest were mostly French, with a few Australians. Three or four incidents are worth recording.

Rubber gloves

I was astonished to find that the French were wearing thick gauntlet rubber gloves. They looked almost like the gloves that chauffeurs were wearing in Britain at that time. The finger tips were thick and wrinkled, and the surgeon's finger did not reach to the tip of the glove, so that holding a needle with finger and thumb was quite impossible. The result was that everyone was using the Reverdin needle. This was a very clever needle cum needle holder. With suitable changing of the needle it could be used for everything: one could do an intestinal anastomosis, close the peritoneum, pull the sheath together, and finally close the fat and skin by merely changing to suitable needles each time. We were all greatly impressed and each of us bought a Reverdin needle. I never used mine and recently gave it to a museum. I realised only then that the Reverdin needle was invented because of the inability of the French to use their fingers due to the thickness of their gloves. We in England were using thin rubber gloves, admittedly not tight fitting as they are today, as in those days rubber with much boiling, lost its elasticity. Indeed, Moynihan brought back to England his first rubber gloves after a visit to Halstead in 1903, when he was presented with a dozen rubber gloves. They lasted him for one year—what a contrast with today. It was bare hands before that.

A horrible operation

The patient was a young man of 18-19 suffering from tuberculosis of his kidney, a common disease at that time. The kidney was expertly exteriorised, the ureter was cut and tied, and a clamp was put on the renal vessels and the kidney was then removed. All very neatly done indeed. At this stage the surgeon turned to

Souvenir of Paris—with Professor Legue's regards

us all and said, "A terrible accident may now happen; your forceps may slip and you will get immense bleeding straight from the aorta etc. I will show you what to do." And with that he took the forceps off, threw them across the theatre, and from the boy's loin an enormous flow of blood appeared. Very rapidly and very dexterously our surgeon packed the wound tightly. After that he worked down from above, putting a long artery forceps on to something which we could not see, but gradually the packs were removed, the wound was dry, and there were at least 15-20 artery forceps sticking out of the wound. We were now prepared for a long session as each forceps was ligatured and tied, but this was not done. He closed the