Medical History

The natural history of preventive medicine, or breaking the chains of causation

LORD TAYLOR OF HARLOW

Summary and conclusions

In the past the natural history of disease has shown chains of causation. With the acute diseases, these chains have usually been quite short and easily broken. With the chronic diseases of today, they are far longer and more complicated. Often they involve patterns of behaviour extending over half a lifetime. These patterns are, in turn, determined partly by genetic make-up, partly by family and social environment.

The study of these chains necessitated both observation and social survey methods. The breaking of the chains entails the use of propaganda or mass education. By far the most effective educational agent is the spoken word, coming from someone held in respect. The most effective persuader is fear.

In social medicine we can seldom plan large-scale experiments. We have to seize such opportunities as life presents. One such opportunity was the creation of the new towns after the war. It was found that good social planning yielded good results in terms of social satisfaction, and infant-mortality and psychosis rates. The prevention of neurosis is a more difficult matter.

In administration and in politics resistance to learning from the experience of others is strong. The preventive medicine of the future will necessitate the teaching of common sense applied to human behaviour to extremely resistant audiences.

Introduction

Until recent years, the chains of causation in public health have been both clear and short. In October 1937 seven cases of typhoid occurred in Croydon. Early in November a Ministry of Health inspector had traced the outbreak to a deep chalk well at Addington. This well had been under repair. The workmen in the well had urinated into a bucket, which was then hauled to the surface. Here they had dug a temporary privy, immediately over one of the adits feeding the well; and one of the workmen was a typhoid carrier. One carrier in the wrong place—or alternatively two pieces of careless behaviour—caused 311 cases

of typhoid with 42 deaths. The entire episode from start to finish occupied two and a half months.

Nowadays, while the old-fashioned public health is just as important as ever it was (and we neglect it at our peril), we are into a new ball-game. Success still depends on breaking the chains of causation, but the new chains which we are just starting to detect are far more complicated and extend over many years. They lack the precise certainty of the food and water-borne diseases. But they are just as lethal.

These chains of causation involve patterns of human behaviour—and here we face a complicated mixture of heredity and environment, education and tradition, facts and fallacies. Many genetic chains only manifest themselves in old age. These are relatively hard to spot because we so seldom see and remember two or more generations of patients in their sixth decade; so comparisons are difficult.

Environmental chains of causation can be nearly as long. It may take half a lifetime of unwise behaviour with tobacco or cakes and ale to produce disease and death. Such behaviour will itself often have a wide reticulum of causation. The complexity of such chains can best be illustrated by taking an event of importance in one's own life, and working out where it all started. The example I have chosen is to trace back how I became involved in the new style of preventive medicine. This has the advantage of showing how new methods of observation led to new methods of practice. It also shows the extraordinary part that "serendipity" or luck (or bad luck for that matter) seems to play in these chains.

Swimming against the stream

I have an inbuilt genetic tendency to swim against the stream. When I was about 10, without rhyme or reason, I proclaimed myself a socialist. My parents and school teachers were horrified, but all were kind and tolerant. It was many years later that I discovered that my paternal grandfather, a surgeon in Chester, was a Gladstonian Liberal and a freemason and my maternal grandfather a Clarion Socialist and friend of Tom Mann, the dockers' leader. So I had a double genetic dose of the what may be called "salmon syndrome." Incidentally, within 15 years of my conversion, I had ceased to believe in socialism as a universal panacea. By then I was a firm convert to the scientific method, and have so remained ever since.

In 1922 my father told me he wanted me to go to Shrewsbury, an admirable school, where he had been subjected to semi-starvation for four years. I revolted. My mind was set on something new. I would go to Stowe. The headmaster of our preparatory school had become second master at Stowe, and I felt safe with him. Besides, the headmaster of Stowe had preached in our chapel and made us laugh. "You never see a

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rabbit seeking for intelligence," he had said, though why we found that funny I know not.

In due course I had my way. So, two years later, I found myself sharing a study with a boy called John Boyd-Carpenter. Even then, he was determined on a career in politics. I was equally set on being a doctor, with bacteriology as my special interest. Alas! I did not know I was colour-blind—so could never spot the red tubercle bacillus against a blue background on a microscope slide. Even then—fed by the loan of a book called *Microbe Hunters* by Paul de Kruif—I had a hunch that prevention was better than cure. It seemed to me to offer the best return for the smallest effort. But I was also in love with biology; here was a science after my own heart, so my student days, spent, after all, in applying biology to human affairs, were a continuous pleasure.

While doing a research job on the medical unit at St Thomas's I heard a BBC radio talk on "Youth Looks Ahead" by my old school chum, John Boyd-Carpenter. If he could do it, so could I. So I wrote my talk and sent it in. It never got broadcast, but I was invited to the BBC to meet a most charming senior BBC talks producer.

The chain moves on three more years to the war. I had become a temporary acting Surgeon Lt-Cdr RNVR (neuro-psychiatric specialist) and was busy invaliding out sailors who should never have been sent to sea when I received a letter from the BBC lady. Would I join her and advise on civilian morale in the home intelligence division of the Ministry of Information? Would I not? This looked like real fun. By pestering the First Lord of the Admiralty she got me out of the navy and into the civil service.

Home intelligence

My friend from the BBC was now director of home intelligence, with the job of telling the Government what the great British public were thinking and feeling about the war—and what, if anything, ought to be done about it. Naturally, but in the circumstances unfortunately, she found the war—even the phoney war—deeply worrying. She felt things were going badly with the British public. I could see no evidence of this . . . stupid perhaps, unimaginative perhaps . . . but defeatist certainly not—or at least only at MoI and Tunbridge Wells.

But the Government had other sources of information. The Home Office had regular reports from chief constables throughout Britain. These certainly did not confirm the gloomy home intelligence picture. Nor did the admirable morale reports, based on the censorship of outgoing mail. So a tremendous row developed, and in due course I found myself in charge of home intelligence, with the job of rebuilding from square one. From then on, we could concentrate on building an efficient and objective machine for the study and recording of home morale and public opinion. The story of what we did and what we found has recently been told, and well told, in two enormous tomes—*Ministry of Morale*² and *Propaganda in War 1939-1945*.³

Survival for home intelligence was always dicey. The readers of our reports—not least the Prime Minister—had to be educated, to understand that the recording of public criticism did not imply endorsement of that criticism. Often it indicated the need for more explanation of official policy. Provided things were made simple and clear, and there was fairness all round—equality of sacrifice, that is—people would put up with almost anything if it was helping to win the war.

For the opinion and morale studies, we built up, region by region, a panel of 2400 observers. Each week we asked a quarter of our panel to tell us what people had been talking about in the past seven days. We asked for majority and minority views—but specifically excluded names of who thought what. Our job was the general picture and not the detection of fifth columnists. We asked for reactions to speeches, new government regulations, any shortages or other difficulties, foreign troops, etc. But we never gave any other leads. Quite soon, it worked so well that,

by Thursday morning, we could tell our readers quite accurately what the British public were thinking and feeling up to Monday night. This we did for nearly four years.

The social survey

Another excellent idea was the wartime social survey—a quantitative interviewing machine to supplement the qualitative home intelligence reports. I had never heard of social surveys when I arrived at MOI. I did not even know the difference between a census (when one counts everyone or everything) and a sample (when one counts only a thousandth part or less, and provided it is a random sample, the result is accurate to within 3% of the total). But I soon learnt all this. I also spotted something else.

To send around interviewers asking the public about their morale seemed to me a dubious operation. At this time everyone was preparing to resist invasion, and German parachutists disguised as nuns were widely expected. Air-raid wardens delighted in denouncing old ladies whose curtains failed to meet, thus supposedly guiding enemy planes in the blackout. The Home Guard—then called the LDV or Local Defence Volunteers—were armed with pikes and private shot-guns, and home-made antitank Molotov Cocktails. The unfortunate interviewers of the social survey were soon christened by the *Daily Mail* "Cooper's snoopers" after Mr Duff-Cooper, the then Minister of Information.

Clearly, for the Government to snoop on morale in this way was ridiculous. But the social survey, as an instrument of practical policy, made excellent sense. As a result of the war, every essential—food, clothing, furniture, fuel, petrol—was in short supply. For each commodity there were controllers, who allocated raw materials and manpower. All needed reliable estimates of genuine need. These the survey could provide, quickly and at small cost. But first I had to educate the departments to ask us to do these jobs. We must act as a service, and not go off snooping on our own without the blessing of the Board of Trade, or the Ministry of Food, or Fuel and Power or whatever it might be.

Now I struck a snag. Good interviewers had to be trained and continuously employed on useful work, or they would leave us for other jobs. Yet the demands for these surveys were intermittent. What we needed was a regular monthly job for them—to keep them busy and happy. Then one day I had a bright idea. I had a friend at the Ministry of Health—Dr (later Sir) Wilson Jameson, the chief medical officer. Long hours of work, the black-out, rationing, evacuation, and general stress and anxiety were expected by everyone to have adverse effects on the health of the nation. Would not the ministry like us to provide a monthly national health index? Yes, by Jove, they would. And so we did. We recorded as objectively as possible, sickness episodes, time off work, visits to the doctor, time in bed, etc. We found people's memories were only reliable for these things over the previous week.

Survey of sickness

The survey of sickness or national health index⁴ lasted from 1943 to 1952. By then a sample of general practitioners were ready to provide a reliable alternative. But the social survey itself continues to this day as an important part of the machinery of government, under the Registrar-General.

The survey of sickness showed the extraordinary fact that health actually improved in war time. The incidence of infectious disease was remarkably low, and low records were set for maternal and infant mortality, still-births, and the standardised death rate. All this was a tribute to the fine work of the Ministries of Food, Labour, and Health, the medical officers of health, and the general practitioners in their surgeries.

Increasingly, Sir Wilson and I started to use the social survey

to practise the new kind of preventive medicine in other directions. He had decided to use the war as an excuse to press ahead with the voluntary immunisation of children against diphtheria. For this, he made use of the government advertising machinery at the MOI. And, of course, the survey had to monitor this, to see which bit worked, and which didn't. Films, we found, were almost useless since they were never shown in commercial cinemas, and the 16 mm shows in church halls etc attracted minute audiences. Leaflets were not read, and just blew about doctors' waiting-rooms. Posters and press advertising helped to reinforce messages from other sources, but had little effect on their own. Perhaps the most valuable form of the printed word was editorial material in women's magazines. Radio talks, especially those directed to women, were also of great importance. The reputation of the BBC as a source of true information was universally high, partly because it never scrupled to give bad news. There was, of course, no television at this time. Its channels were needed for radio-location or radar.

The one overwhelming method of persuading people to take action was the spoken word—from someone held in respect. This meant, in effect, the doctor, the district nurse, the midwife, or the health visitor. Strangely enough, in the *BMJ* this year⁵ Morris reaches precisely the same conclusion. In promoting health, he says, individual guidance is essential, "especially among the lower social classes, who need it most and whose life style is responding least to the general message."

Sir Wilson's boldest propaganda effort was his anti-VD campaign. From this we learnt the importance of frankness and honesty in overcoming false modesty and squeamishness, also the importance of fear in motivating behaviour. This same lesson is clearly demonstrated in any community when lung cancer or coronary thrombosis hits someone who is a heavy smoker.

Building a new town

Once again, quite by chance or luck, but with an equally long chain of causation, I had another unique opportunity to study preventive medicine. On 15 May 1950, I was made a member of the Harlow New Town Development Corporation. I worked at this job, part-time, for 16 years.

The small Essex town of Harlow and its surrounding villages, 23 miles (37 km) from central London, housed some 2000 people. Our general instructions were to build a town for 60 000 Londoners (later raised to 80 000) in which we should provide not only homes but work, shops, schools—the lot. If London itself was to be rebuilt decently after the bombing at least half a million people with their jobs had to move out. Hence the ring of new towns round London. Despite the influx of migrants from overseas, the population of inner London has steadily declined. So this part of the exercise has been successful.

Here we were changing the environment of tens of thousands of families. What would it do to them? What would it do to their social patterns, their health, both physical and mental, and indeed their happiness? Here was a splendid experiment in preventive medicine, set up for us by Mr Hitler, Sir Patrick Abercrombie, and Lord Silkin.

By good fortune, we had a superb chairman, Sir Richard Costain, who was a practical builder of enormous experience, and a superb master-planner, Sir Frederick Gibberd. Sir Frederick had written a standard textbook on town development, and although he was famous for his prewar flats, he was certain that most of the people coming to Harlow wanted houses with gardens for their small children. By social survey methods we studied our potential customers in the "exporting" boroughs of London. We were able to show that the maximum number of flats needed was 10%—of which only half, 5%, could be in multistorey blocks with lifts. We wanted some tall blocks to break up the monotony of a town of two-storey houses, but they would be acceptable only to single people, particularly in the professions, young married couples with no children, and some

older people whose children had left home, and who were not yet too frail to manage the stairs when the lifts were out of order. Most old people wanted bungalows, close to the shops and to the homes of their grown-up children. These we set out to provide.

With Sir Frederick we planned and built Harlow as well as we knew how. He taught us to strive for "urbanity" and relatively tight development in the town areas, with the major traffic flowing along roads without housing alongside, and "green fingers" of country, parks, and playing-fields going right to the town centre. We taught him that roofs must be pitched to be watertight, that few people wanted to live or work in glass-sided rooms, and that back-gardens must be fenced to keep the toddlers safe.

We divided the town into four neighbourhoods of 15 000 each; then each neighbourhood into four sub-neighbourhoods. For each sub-neighbourhood (of say 1000 families) we provided one primary school, one meeting-place (or tenants' common-room), one pub, four "round-the-corner" shops, one church, and plenty of play space. Then for each neighbourhood we had a major shopping centre with 40 or more shops and one multi-lateral secondary school with huge playing fields. For the town as a whole we had a big town centre, with offices, big shops and multiples, market, restaurants, cinema, theatre, and plenty of parking space all round.

Industry and population grew in step; so we avoided the "poverty trap" that had produced malnutrition on the out-county municipal housing-estates, where long journeys to work and relatively high rents ate up family incomes.

Social phenomena

We did not really know what we were doing. We guessed one house in four would need a garage. The affluent society soon proved that wrong. We guessed most people would bicycle to work, and so we provided splendid bicycle tracks. It has taken 20 years for these to come into their own. Quite unintentionally, we broke up the vigorous street life of the East End. Whereas the men settled well, with their jobs and mates and sports, it usually took the women at least two years to overcome loneliness and New Town blues. Then a strange thing happened. They started entertaining each other in their own homes. In other words a working-class community was assuming a middle-class pattern of behaviour.

The first thing most young couples did on getting a home of their own was to start a family. So for some years, Harlow was pram-town. Then, between 1966 and 1975, the crude birth rate in Harlow dropped from 21.4 to 12.1. This reflected the change in age structure of the population, as well as increasing use of the pill.

The infant mortality rate is a good measure of community health. Between 1961 and 1975, the IMR in Britain fell from 21.6 to 15.7. In Harlow it dropped from 20.6 to 9.0. Thus an industrial working-class community had, in health terms, been raised to the level of one of the wealthier middle-class suburbs.

Two more Harlow successes can be recorded. We aimed at industrial diversity. One-industry towns are terribly vulnerable to technological change. We built over 150 factories, none of which employ more than 800 to 1000 workers—and most are much smaller than that. The result is that Harlow now is running at less than half the average unemployment rate for Britain; and strikes and industrial unrest are rare.

In sport we made tremendous provision. Our big sports centre was one of the first in the country. Schools offered both rugby and soccer. The town golf course, designed by Henry Cotton, is a delight. After two decades we are starting to see the dividend in national sporting performances.

Clearly we have built a healthy, vigorous, and self-sustaining community. Have we also built a happier one? The great majority of the people who live there are pleased with Harlow. But this goes for almost all towns outside the great conurbations.

Mental health of a new town

In 1959 Dr Sidney Chave and I decided to do a comprehensive psychiatric survey⁶ in Harlow to find out how things compared with the so-called exporting areas.

In brief what we found was this. We expected that the incidence of psychosis would be unchanged by migration, but that the incidence of neurosis would be reduced. In fact the picture was the exact opposite. Movement to a new town, with all its social advantages, appeared to have no effect whatsoever on the incidence of neurosis. But the incidence of psychosis was cut by two-thirds.

Our final conclusions were these: the neurotic tendency is exceedingly organic; the environment determines only the pattern of symptoms. With psychosis, by contrast, although there is a strong genetic predisposition, the environment is of prime importance. In a first-class social environment, up to two-thirds of psychoses can be prevented. We provided in Harlow first-class medical facilities. The young Harlow doctors treated their psychiatric patients with unwearying sympathy and kindness. Such care was probably a major factor in preventing the psychoses. But the neuroses seem to need something different.

When I was carrying out my nation-wide survey of "good general practice" in 1951 and 1952, I found that the incidence of "declared neurosis," as it were, did vary from place to place.⁷ There seems to be a big group of up to one-third of the population who are potentially neurotic (in which group I must include myself). Whether this is medically and socially declared depends on medical and social attitudes. In the smaller country towns (5000-20 000 population) everyone tends to know everybody else but neurotic behaviour gains scant sympathy, from friends or relatives or from doctors. Such a robust attitude seems to do more good than sympathetic introspection. In such towns the "declared" neurosis rate may be as low as 5%, though the neurotic potential, or "subclinical neurosis syndrome" is, of course, the same as elsewhere.

The NIH syndrome and the new town

Now I come to an extraordinary phenomenon first christened by Professor Solly Zuckerman.⁸ As the British armies advanced across North Africa, he was employed to study the effects of our bombing, so that we could apply the lessons to the future bombing of Germany. Solly's simple factual surveys soon convinced Mountbatten, Eisenhower, and Tedder but not "Bomber" Harris and his American opposite numbers. Solly wrote: "To those with firm preconceptions our findings were vastly unpopular. . . . They would go to any lengths to suppress them . . . some even thought I had hypnotised Tedder. . . . I soon encountered an almost universal reaction to any new proposal, however soundly based on science and common sense—the NIH—not invented here syndrome." One is reminded of Galileo, of Darwin condemned by the Church, of Lister spurned by the surgical establishment, of Florey rejected by the MRC, of Beveridge loathed by Churchill. In my experience truth and right prevail in the long run, but the run can be very long indeed, and the harm done en route can be very great.

I had expected that what we had to teach at Harlow would be readily accepted and rapidly reproduced elsewhere. Nothing could have been further from the truth. Harlow was subjected to a continuing barrage of criticism. It was an autocracy; it was over-planned; it was under-planned; it was too diffuse; it had too few flats; it had too much green space; it was unoriginal; it harked back to the past; it was not towny enough; the main traffic arteries should have been built up; it needed a "grid-iron" pattern for its streets; it was—in the final condemnation—a "first generation" new town. So the smart young planners went ahead and produced the horrors you can see in all too many of the second and third generation new towns. Every error that we had carefully avoided was perpetuated elsewhere with a

flourish for its great originality. Tower blocks, we had shown, were suitable for 5% only of the population; the new city planners provided them for 30, 40, or 50%. And when these failed, they banned them altogether.

Nowhere was this reluctance to learn from the experience of others more graphically shown than over the health services. The medical officer of health for Essex wanted to provide four expensive health centres for the new town. The Ministry of Health forbade this. He (the MOH) resubmitted a much cheaper scheme, and it, too, was rejected. The Ministry then ordered the Harlow Development Corporation to provide doctors' surgeries attached to individual dwellings.

At this point, I sought the help of the Nuffield Provincial Hospitals' Trust. I had already found that the best practices were usually found in the smaller country towns, where the doctors provided their own group-practice premises. What we built at Harlow were group-practice centres (for GPs and for dentists in ordinary practice) with clinics attached, the GPs and dentists being in full control of their part of each centre. So we provided Haygarth House, Nuffield House, Osler House, Addison, Keats, Lister, and several more. Thus we became the first large town to have all its doctors in group practice, with the clinics working alongside them. We had achieved this only because they were not health centres in law.

At every step we were obstructed by the ministry. If they could not, or would not, provide, no one else should. Yet when we started to succeed, the ministry's public relations department started sending us parties of foreign visitors (including even the King of Sweden) to show how well the NHS was working.

Slowly, slowly, over 25 years the lesson that good general practice requires that the premises should be owned and controlled by the doctors themselves has penetrated the heads of our profession. But not before 1000 official health centres have been built; of these I estimate over half to be totally unnecessary, since they have been provided in country towns and middle-class suburbs. These are precisely the places where the GPs have usually already provided fully adequate group-practice centres.

The attitudes of the Labour Party and the Socialist Medical Association were also interesting. We completed, and opened, our first group-practice centre with clinics attached many months before the LCC's first health centre at Woodbury Down was ready. Ours—for three doctors—cost under £3000 a doctor. Theirs, for eight doctors, cost over £30 000 a doctor. In my innocence I thought that such a demonstration, that group-practice centres with clinics attached need not be prohibitively expensive, would be welcomed by the Labour Party. Not a bit of it. I was treated as a traitor for daring to question the established orthodoxy that health centres must be built and controlled by the local authorities—or not built at all.

The path of the reformer is a tough one. In a dictatorship, you can, in theory, get things done quickly. But there are many weak links in the chain from the top to the periphery, as the Shah has recently found out. Moreover, the chances of making wrong decisions are very high; it then takes a revolution to put things right.

In a free democracy, such as we enjoy, even when the truth has been clearly demonstrated we go on getting things wrong time after time. Any idiot is allowed, or even encouraged, to have his say. Right answers to difficult problems are continuously ridiculed. False information is disseminated. Emotional appeals to unreason are stimulated by meetings, marches, protests, sit-ins, and lie-downs—aided and abetted by television. Even sensible people get caught up in this rubbish.

Yet, in spite of it all, a free democracy is the best of a bad lot of methods of government we have thought of so far—as Sir Winston pointed out. Reason and common sense win out in the end, but one has to stick at it for years and years.

This is just the battle the new preventive medicine is going to have to fight. Ranged against it, besides many an honest Conservative or Labourite who does not like change, will be every nut and libertarian do-good, every hedonistic bleeding

heart, every advocate of Marxist authoritarianism, and the permissive society. For victory, we shall need cool heads, warm hearts and steady hands. Given an appropriate quantum of good luck, I think we shall just scrape through.

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MATERIA NON MEDICA

Ye Gods, what's that?

Having served my apprenticeship for several years by attending regularly as a guest, I was eventually invited to become a member of our local social club. This is something of an honour. The club was founded in Queen Victoria's heyday when our now venerable suburb was just being built. It has survived two world wars, a depression, urban emigration, social upheavals, and television. It is limited to 80 men (women are not considered) and there is, understandably, some considerable competition for a place. Its function is to promote friendship and neighbourliness and I know membership depends more on the state of your roses than on your position in life.

The club meets every month during the winter and there are a few summer outings to pleasant places. It has altered little over the years. Entertainment takes the form of musical evenings, choirs, guest speakers, and an annual whist drive. Ladies may come as guests. Any modern aid is viewed with some suspicion, and speakers, like Mr Gladstone, are expected to capture the audience by force of personality alone. This fairly separates the men from the boys. A piano is, of course, both accepted and acceptable for the musical evenings and who can forget the night a young man entertained us with a bassoon. His reception was a mixture of astonishment, disbelief, and the admiration one accords a polar explorer. He never came back.

After some 12 years as a member I received the ultimate accolade—I was asked to be a speaker. "I know you are a doctor," said the secretary as he issued the invitation, "but, tell me, what exactly do you do?" That is how I came to deliver a lecture entitled "Community medicine. Ye gods, what's that?"

On the whole, it was well received. The audience was more than sympathetic as I stood alone in front of them clutching my notes, for was I not, indeed, a fellow member. They followed my description of the specialty with a fine interest and quite a few laughed at my jokes. The applause when I finished could clearly be heard above the rattle of the tea preparations. Question time, which followed the interval, when tea was served with brown bread date sandwiches, was lively enough once the chairman had called for support. The queries, however, seemed more related to high technology medicine than to prevention. My wife stayed away; she said she had to visit her ailing aunts.

After it was all over, the secretary was kind enough to take me aside for a reviving glass of lemonade. There he presented me with a book token. He ignored my protests with the same skill he used to field my questions on how well the talk had gone over. "Your lecture was most interesting," he said, after a pause, "but tell me, what exactly do you do?"—WILLIAM THOMSON (chief administrative medical officer, Lanarkshire).

A romantic interlude

Sealink had promised a "romantic interlude." For just £20, they would ferry two people and a car, return, across the Channel. The opportunity was too good to miss.

We left London early in the morning, and despite torrential rain made good progress to within three miles of Newhaven. Then disaster struck. The car went through an enormous pool of water and stuttered to a halt. With only an hour until the boat sailed, there was no time to wait for the AA. We seized a lift into Newhaven, stopped off at a likely looking garage, and within 20 minutes they had a mechanic on the scene. He failed dismally to start the car, and eventually it

had to be towed in. This procedure cost us £21. The car soon started in the dry, but by this time we had missed the ferry. The next one did not leave until 7 pm.

We had a romantic afternoon in the Seaford nature reserve, but it wasn't quite the afternoon we'd expected, which was shopping in the famous street market in Dieppe. To get on to the ship that evening involved sitting in the car for an hour, occasionally moving 50 yards forward to some new barrier, where there was a further check on documents; next there were more interminable waits. The sea crossing was rough, and we were pleased to arrive in Dieppe. Until, that is, we realised that all the cheap guest houses which we had planned on using were now shut, it being midnight due to the time difference, and that the only hotels left were a trifle chère.

The following morning the rain bucketed down, while gale force winds began to accumulate in the Channel. We were blown off the promenade, and eventually decided to get soaked in the backstreets instead. We marinated ourselves in coffee and alcohol and had a decent lunch before tackling the picturesque castle. It was shrouded in mist, and we beat a hasty retreat.

At 3 pm the casino opens in Dieppe. About half a dozen rather guilty looking locals slouched in in their overcoats and we spent an interesting half hour and 50 francs over a game of boules, a sort of poor man's roulette. Happily, we had reservations for the 6 pm ferry, and presented ourselves at the appointed hour.

"There is no room for you, M'sieu," said the attendant.

"Ah, but we have reservations," we replied smugly.

"They are no good," he said.

Inside the office there was pandemonium as the occupants of five British cars, all with reservations, shouted at the French about the injustice of it all. The manager was summoned. It was no good, he said, the storm at sea meant numbers had to be reduced. As he spoke, a huge juggernaut was trundling on to the ship. Despite invoking the names of Barry Norman and Esther Rantzen, the upshot was that we all had to drive the 100 miles through the rain to Boulogne. We arrived home at 1.30 am.

For our next romantic interlude, we're going Awayday to Clacton.—JULIAN JESSOP (surgical registrar, London).

WORDS BALSAM is a viscous aromatic oily or resinous substance of vegetable origin; many members of this group contain benzoic acid (WORDS, 17 February, p 466). The *G balsamon* appears to derive from various Hebrew words (the dictionaries are uncertain) of which the most attractive is "*ba'al shemen*," prince of oils (Robert Hooper's *Lexicon Medicum*, 1839). The medicinal use of the balsams of Peru and of Tolu (a town and district of Colombia) is now archaic, but Friars' Balsam is still prescribed. TOLUENE was first obtained by distillation of Balsam of Tolu. From balsam we have BALM, a fragrant oil or ointment for external application, with soothing or healing properties. Hence balmy (not to be confused with barmy). To EMBALM is to preserve a cadaver from putrefaction by perfusing the blood vessels with formalin; originally, to do so by impregnation with spices or balsams. Colophony (from Colophon, a town of ancient Lydia in Asia Minor) is a resin used as a flux in the soldering of electrical contacts, and has been responsible for inducing an asthma-like condition in factory workers exposed to its fumes. Is it just coincidence that toluene (tolylene) di-isocyanate, used in the manufacture of plastic foams, has induced severe asthma on repeated exposure?