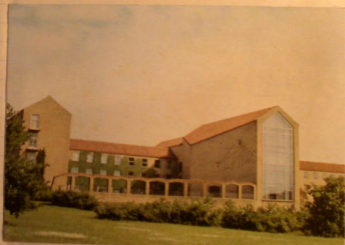


AN
ACCOUNT OF THE MEDICAL SUMMER SCHOOL
IN
DENMARK
1956

PRECLINICAL COURSE
AT

THE UNIVERSITY OF AARHUS



I was off at last. During the past few days I had not been as excited as I thought I should be, but now as the coach pulled out of Ilkerton the thought of the places I was to visit awoke my interest once more. Soon it was 9.0 AM and time to change coaches at Preston, and then sleep, disturbed only by an occasional stop at some road side cafe as people dragged themselves out for a cup of coffee. Looking out, one could see other coaches with people in similar attitudes of sleeplessness. Then it was London, cold, but dry, at 7.45 AM on Friday morning. This was the day when, for most of the party, the trip really began.

London Victoria 1.30 PM. Slowly they arrived and surveyed their fellow students, representatives of many Universities and hospitals, and I with what we found to be rather typical of this party, they were not at first right impressed by those they saw, but no doubt their attitude would change: and it did. Dover - Ostende. A fairly calm crossing but just rough enough to pick out the inevitable poor traveller who was to suffer even more on the twenty four hour train journey through the continent. The journey for us was quite pleasant, and most of the time we managed to sleep, except for occasional glimpses at the furnaces of the Ruhr or to listen to the cries of the bridge fiends next door. On we went Brussels, Liege, Cologne, Dusseldorf, Essen, Munster, Bremen, Hamburg, and at last Medicia. Here we left the Nord Express and after some delay caught the train to Aarhus where we encountered the first hitch. As the course did not begin until Sunday no accommodation had been booked for Saturday night. But this unfortunate state of affairs was soon overcome by our friendly hosts and we spent the night at the best hotel in town, after having been trapped in the lift for fifteen minutes.

On Sunday we had our first real taste of Danish food and decided we were going to enjoy our stay. The rest of the party arrived that day by plane, motor cycle, and train. Eventually we were ready to begin the course - forty seven of us in all. Fortunately one was a Norwegian who could pass on to us any messages from the proprietors of the hotel, although not so fortunate for him, as he

would get roused from bed very early whereas there had been a party the night before and no one had returned for breakfast.

MON. August 13th That morning after a continental breakfast we were shown over the main University buildings, and though I have seen no other Universities outside of England, we claim that this was the most modern University in Europe was easy to accept. The most impressive feature was the assembly hall; one end of which, was a massive window flanked by green ivy struggling to reach the lofty roof. The seats round the sides of the hall were covered with the black and white hides of Friesian cows, and those of the centre with pig skin. We were told of the low level bombing carried out by the R.A.F. in order to clear the Gestapo from some of the buildings occupied by them during the war. Then followed a reception; the first of many we were to be given during our stay amongst this most hospitable people. That afternoon we visited the old town. Here, from all parts of Denmark, old houses have been brought and carefully rebuilt as an open air museum. No one lives here but one could just see the scenes described in H.C. Andersen's fairy tales. It was not difficult to imagine the tin soldiers in his paper boat floating by on a miniature torrent down the side of the cobbled street, whilst the ugly duckling was swimming right there on the stream by the old mill. The Lord Mayor's house was full of history and here was friendly banter with our Danish hosts as we examined sketches of the battle of Copenhagen, fought between the Danish fleet and the English.

Late in the week there was a visit to the Ceres Brewery where, after being conducted round, we were entertained in an underground ale house. In the seat of the cellar mushrooms were being grown on a large scale for market in the city. A tour of the Cathedral provided us with much interesting information on the history of Danish architecture; and there was an organ which Doctor Albert Schweitzer regards as being the fifth best in Europe. The guide said that, if all the keys on every manual were played at once, it is estimated that the sound wave would flatten the houses within a radius of twenty five miles. After viewing the city from the towers I paid a visit to the fishing fleet. On the jetty was a shop selling fish, kept alive in tanks until required.

Thursday was a really busy day. We had a chance to see a little of the social services of which Denmark is so proud. First a children's day nursery was on the programme. How the nation gave a short account of the work being done; then left us with the children, their ages ranging from six months to about four years. We couldn't speak Danish, but neither could most of them, so we were soon friends and found that baby language is the same whatever your nationality, which seemed to us a most sensible arrangement. From here we went to the other end of life's cycle - to a home for elderly people built right out in the suburbs, flanked by green lawns and looking out over a lake. A truly beautiful setting in which to spend one's latter years. In small groups, each with a Danish student as interpreter, we visited some of the rooms and talked to the people there. All seemed very happy in their own rooms, surrounded by their own furniture and personal effects brought from home. They would show us their most treasured possession, be it a photograph of some one dear to them, or a medal for long service in agriculture. Before we left we had to sing for them, and they joined in, especially with songs popular during the war. On once more. This time to the Town Hall. Again more speeches, refreshments, and sightseeing. The most impressive room being the council chamber, carpeted by a huge woven map of the city. The lamps appeared to be floating in the air and the chairs of the councillors were covered with pigskin and twenty two coat gold lettering. We sat in the gallery, flanked by the desks of the news paper reporters. Afterwards, as I walked back to the hotel, I was surprised to see a minesweeper of the British Royal Navy steaming into the harbour. Later I was able to speak to a few of the sailors.

A visit to the Pathology Department on Friday morning provided us with quite an insight into the kind of research being carried out. We were told that the scientists have every facility to follow their own interests both in research and in teaching. This they are more able to do, in a small country. There was one section devoted to cancer research. This is connected with the cancer hospital, so that information regarding therapeutic agents found useful in combating tumours in mice can be passed on to the hospital. This department is sponsored by the civil defence authority, and many of the tissue cultures are subjected to tests

using radio-active materials. Another section was concerned with the study of rheumatoid arthritis, and our tour ended in the blood donors' record department, which records donors of most of North Jutland.

That night there was organised a tour of the surrounding countryside. Passing along a white ribbon of road that stretched for miles ahead, we looked out over the fields, yellow with ripening grain, interrupted here and there by ground crops. There were no hedges round the fields except where a few cows grazed, sometimes each tethered to a post, and then there would be a single line of electrified wire surrounding them. The thatched white-washed cottages were all single-storeyed, usually standing alone in the sea of grain, but sometimes clustered round a farmhouse built on three sides of a square; the sides forming the barn, shippon, and dwelling house. The climax of the tour was a party held in an old mill house where we danced until midnight by candle light, and then drove home through the silent countryside.

The weather next day was not too good and most of us spent our time writing those cards we had promised to send, but had never got round to sending. So that was the end of our first week; so much had happened in so short a time. But, you may ask, what of the lectures which were being held? Well, this was Denmark, the lecturers strangers, and the subjects intriguing, so even though on holiday we were keen to attend.

In our first lecture "Hypoglycaemic Sulphonamides" Professor Lundbaek concentrated on the problem of diabetes. In Denmark the patient in whom diabetes has been diagnosed - often at first by the patient himself - is sent to hospital for initial treatment, lasting two or three weeks, during which time the diet is strictly supervised and then he is allowed to go home; but is still under the care of a clinic or doctor. The Professor went on to explain a little of the history of the treatment in cases of diabetes leading up to the recent discovery of the drugs BZ 55 and D 680, which have an anti-insulinase activity, and therefore have the same ultimate effect as insulin in keeping the blood sugar concentration normal. These drugs have the advantage over insulin in that they can be taken orally, but it was pointed out that, in Denmark at any rate, they would not be used for two or three years in order to discover first whether they would accelerate the vascular diseases which



— THE OLD TOWN — AARHUS



— THE TOWN HALL — AARHUS



- THE CATHEDRAL - AARHUS



- THE ORGAN - AARHUS CATHEDRAL

- A GROUP OF DANISH CHILDREN -

- A DANISH COTTAGE -

develop in all diabetics; especially in the retina of the eye, and in the kidney. However research has shown that with BZ 55 only a slow change in blood sugar concentration occurs ^{as opposed to} the rapid reaction to insulin, and also the blood sugar concentration in some diabetic patients remained normal two or three weeks after injection with BZ 55, when no concentration of the drug could possibly be left in the body. The reason for this has yet to be explained.

Doctor Gotzeck in his lecture "Fundamentals of electrocardiography" spoke on the different types of electrocardiogram at present in use in the United Kingdom and in Denmark, and the advantages of using different sets of leads. Unfortunately in the short time at his disposal he could only cover the ground very quickly, and most of his lecture though interesting was revision of work we have already done; but of course he explained it in much greater detail. Again in the lecture on "pH of the blood" we found that because the lecturer did not know how much ground we had covered (in Denmark the course is almost two years longer than in England) he tended to give us basic facts, when we could have wished for something more ambitious. Even so, a subject about which we probably thought we knew something, was presented in an entirely different way. Explanation of the clinical aspects, in which we have not had much experience, made us realise how important a part our theoretical work will play when we begin our clinical studies.

"The resistance of bacteria to antibiotics" was a subject in which we had never taken much interest, or indeed realised it could be so fascinating until Doctor Stenderup introduced us to it one Thursday morning. As our knowledge of the antibiotics was probably little more than that of the layman I suppose most of us thought "Ah yes, the wonder drugs give the patient a shot of penicillin and all your troubles are over" but we were to discover that they might only be beginning. Doctor Stenderup told us the three factors to be considered in the use of these antibiotics were, cure, side effects, resistant strains. We were told that in one hospital the resistance of bacteria to erythromycin rose to 75% in four months, but after discontinuing its use for four months the resistance fell again to 25%. Sometimes the bacteria become not only resistant to the drug but dependant on it and therefore cannot multiply without it. One of the dangers encountered in the use of eg. streptomycin, was, that if the bacteria present in the patient were resistant to the drug they would be excreted and might infect other patients; also up to this time it

had been possible to treat with streptomycin. In order to prevent these resistant strains from developing, two drugs are usually given simultaneously, or else the initial doses of any particular drug are made so large, that the resistant strains do not have time to develop.

Although it was difficult to differentiate between any of the lecturers I think that the chief physician of the Commune Hospital, doctor Bulson, had a better command of English than any of his colleagues. This he showed, again and again, throughout his lecture and in later meetings with him, by the way in which he could joke and appreciate jokes in what was to him a foreign language - a most difficult thing to do you will agree.

The junction between a nerve ending and a muscle, the neuromuscular membrane, is polarised, and when a normal impulse passes from the nerve to the muscle, via the subneural space, then acetyl choline is liberated. This depolarises the membrane immediately and therefore the muscle contracts; but following this, acetyl cholinesterase passes into the space and destroys the acetyl choline; the membrane is repolarised, and the motor end plate is restituted. If a curarine drug is given it produces a barrier at the end plate preventing the acetyl choline from depolarising the end plate i.e. the sensitivity to acetyl choline is decreased, (or the threshold value is increased,) therefore no muscle contraction can take place and paralysis results. On the other hand, some curare drugs act like acetyl choline itself and depolarise the motor end plate. Contractions or twitches result because the esterase cannot break down this type, (eg. succinyl choline) as quickly as it can break down acetyl choline. Thus there are two classes of curarising drugs and it was the results of experiments, carried out on volunteers with these two classes of drugs, which the doctor described to us.

The experiments were divided into two sections (a) the effects on the respiratory muscles and (b) the effects on the extremity muscles. There were of course difficulties to be overcome eg. when testing the force of contraction which a patient could produce, they found, that as the effects of the drug wore off the subject tended to suddenly give a much better contraction, only to show that he could pull hard; instead of giving a series of contractions increasing in force. Again when recording respiratory movements: if the subject was at all anxious then the trace produced was inaccurate. To overcome these errors electrical stimulation was given direct to the muscle. The average sufficient dose of drug was found which would produce complete paralysis of arms and legs whilst producing

a minimum amount of reduction in respiration. This dose gave a 50% reduction of power in arms and legs whilst giving less than 20% decrease in the volume of tidal air in the lungs. It was found that some people have a higher tolerance to a curarising drug than others, and it was discovered, that if a person had a higher tolerance to one, then he had a higher tolerance to all. Because of this, the effect of a given amount of any one drug on any particular subject cannot be predicted. During an operation, the drug succinylcholine can be used for a short time, but for a long operation an intravenous continuous effusion must be given, and even with this continuous effusion, after about an hour, the muscle contractions return and are better and stronger than originally, and are also continuous. So the dose of drug has to be continually altered. The doctor ended his very lucid lecture by telling us that all the volunteers for these experiments came back to volunteer again and in all had about a dozen experiments performed on them using these drugs.

The first lecture given by Doctor Darling PhD on Biochemical genetics was unfortunately another instance in which we revised work which we had already covered, and I was later to miss the second of his lectures due to the fact that I was on the surgical ward on the morning he delivered it.

The final lecture in that first week entitled "The coronary circulation and disturbances thereof" was given by Professor Holten. After a brief summary of the anatomical structure of the heart and its blood supply, we considered the effects of disturbances in the circulation, most of which, we were told, could be attributed to a common cause - hardening of the arterial walls, especially the tunica intima, which surrounds the lumen of the blood vessel. This disease is known as arterio sclerosis. The artery is narrowed and hardening of the wall causes a slowing of the blood flow, thus increasing the possibility of a clot forming, particularly if the hardening is due to a pathological condition when the wall may be rough. If the artery is occluded completely, near its origin, the death occurs immediately - heart stroke, but if it is only a small branch which is occluded, then the area of myocardium it supplies becomes ischaemic, and if the blood supply is not quickly restored, the muscle fibres die, and infarction takes place i.e. the muscle is replaced by a fibrous scar. Then followed a discussion of the clinical symptoms in typical cases and their treatment. We were told that heparin is sometimes administered intra-

venously. This acts immediately to prolong the clotting time, but as it must be administered every five hours then it is not very convenient if the treatment must continue for some days, and therefore dicoumarol is usually ^{administered} every mouth. This is an advantage, though its effect only begins to show after twenty four hours. The maximum effect one can expect from anti coagulant treatment is obtained using dicoumarol, and this treatment has resulted in a 12% fall in deaths from these vascular diseases. However this is not, we were told, a curative therapy. Arterio sclerosis cannot yet be treated directly, because we know so little about how it is caused; though most people have it, albeit in a mild form, from the age of ten onwards.

Sunday August 19th: In the morning a few of us went to a service in the cathedral, and though we ourselves understood only a little of it, our Norwegian colleague could translate from time to time. After lunch the Vice-President of the municipal orchestra invited a few friends and myself, to his flat, to enjoy some records. We gratefully accepted his invitation and found his home most interesting. I was to visit several Danish homes during my stay but this was the first, and the things which impressed me most, were those which I discovered about every one. — large, well lit rooms, with bright colors everywhere and green plants trailing up the walls. The water was centrally heated in a special works and piped to all the houses in the district. A very enjoyable afternoon was spent listening to a collection of various records and we were sorry when the time came to leave.

The coming week was to be spent far away from lecture halls and city streets; in the international student centre at Hald, and so on Monday morning, the last minute packing completed, we left the hotel by coach at 9.30. The day was fine and sunny as we sped through the lake district, stopping first to look round a ruined monastery, and again at Sky Mountain, where we ate lunch. This "mountain" is only five hundred feet high; for though there are many beautiful lakes in Denmark, there are no mountains between them, and the top of this hill is the highest natural point in the country, although the tip of the television transmitter is even taller. The view from this hill was really magnificent and after lunch we walked down through the woods to the lake, picking bilberries as we went. At the landing

stage a small motor launch was waiting to take us along the winding lakes and rivers, until, ninety minutes later, we landed in Otterborg; a town such as one might find anywhere along the Thames. Here, after taking the usual photographs, we again boarded the buses to travel across the moors to Hald.

This large country house was owned by a Dane, who during the war collaborated with the Germans; so in 1945 the house was taken from him to be used as a centre for students from all over the world. Here we were to live for a few days with students from some fifteen different nations - Dutch, French, German, Italian, Spanish, and many others. One student had been wounded during the Korean war fighting for the South Korean army.

After each meal there was an appeal for volunteers to wash up, lay the tables, or peel potatoes, and this usually meant each person doing one task at some time during the day. Apart from this the time was our own to read or row on the lake, to cycle, (these could be borrowed for one shilling a half day) or play table tennis, or just wander around the countryside. At night various activities were arranged, such as piano concerts, talks, or country dancing. On Wednesday, a visit to the Red Cross sanatorium had been arranged for the members of our course, and we also took some of the other students along who were interested. A tour round the extensive hospital was conducted by the superintendent. The highlight of the tour was a demonstration of a large model electric railway, on which some half dozen trains were directed through model stations in tiny villages, past the old mill wheel slowly turning, then into a long tunnel and out again into fields in which cattle were grazing. Here we stayed for nearly twenty minutes, probably much more enthralled with this exciting model, than the young patients for whom it was intended. We met a few English physiotherapists and later had a marvellous time trying out the various machines designed to increase muscle power after operations. One particular machine was in the form of a horse saddle on a short bench which bucked and rolled when it was switched on. Towards the end of our tour one or two members of the party were volunteered to undergo electrical treatment in which static electricity was passed through them making their hair stand on end, and short spains dark



— SILKEBORG —



— INTERNATIONAL STUDENT CENTRE — HALD

from their finger nails, though they felt perfectly normal the whole time. This machine is normally used for patients with persistent head aches who cannot be cured in other ways. After thanking the superintendent for his hospitality we had some light refreshment before walking back to Hald for dinner. Later that evening a folk dancing instructor led a class in Danish country dancing; some of the Danes being in national costume. Altogether it was very enjoyable and extremely popular.

The next day I visited the neighbouring town of Viborg and looked round the cathedral. As I did not arrive back at Hald until late afternoon I was too late to see a team of fellow British students beaten 3-2 at soccer by a team made up of students from European countries. That night the IMCC gave a dinner for all the people who had helped to make the visit a success, at which we observed the Danish custom of making speeches between courses instead of at the end of dinner. Afterwards a dance was held which went on until the early hours of Friday morning.

My friend from Liverpool worked with a Danish nurse at a TB. Hospital in Christiania during the first part of the vacation, and her home was in the town of Skive over in West Jutland. On learning that he was to visit Denmark she had invited him to call on her, as by that time she would be home again; so on Friday we borrowed cycles and rode to Skive. The town is about twenty four miles from Hald over gently undulating country which made very easy going. The nurse and her family were very pleased to see us and took us to visit the local sanatorium. This is a large white stone building surrounded by lawns set high up overlooking the sea. The matron showed us round and told us that from time to time patients are sent here from England to be treated.

As there were no lights on the cycles we wished to rest of early to get back to Hald before dark, but Greta's mother insisted we stay until eight o'clock, to meet Kai soon, who was studying English, and would be very disappointed if he should miss us. So, finally setting off at eight thirty, we cycled back in the dark. The journey seemed endless and fortunately for us we were able to use the cycle tracks round the towns where there was likely to be much traffic, although on the main road we went for miles without passing a single vehicle. Eventually we arrived at the centre at 10.40 pm and the next day returned to Aarhus.



— RED CROSS HOSPITAL — HALD



— THE CATHEDRAL — VIBORG

Sunday was the last day on which one could cross by boat to Mohra peninsula on the other side of the bay, so we decided, that whatever the weather was like we would go. Well, the ferry boat was very small and with only ten passengers on board she bounced like a cork, especially when a thunder storm broke as we were half way across, but we arrived safely.

At a small kiosk by the jetty on the far shore I was enquiring about some post-cards using sign language, when the gentleman behind the counter surprised us by replying, "Yes I think we may have a few left here." We discovered that he had been in the Danish Merchant Navy before the war, and the day war was declared his ship was a day out from Newcastle, sailing for Denmark, so she put about and returned to England. During the war this sailor was on British ships until his return to Denmark in October 1945; which was the reason why he spoke English so well. That afternoon we enjoyed a pleasant walk through the fields, picking mushrooms as we went, and a farmer, who spoke no English, showed us round his farm as we conversed in sign language for almost half an hour. The return crossing took about an hour and was even rougher than the first. On reaching the hotel, I borrowed a pan and fried the mushrooms together with sausage bought from a machine. In Aarhus almost anything from two or three cakes to a bunch of flowers or a box of eggs can be obtained from a machine.

My opportunity for visiting the surgical wards came on Monday morning. After being shown the various departments at the hospital and seeing the blood bank, an artificial kidney, and several other interesting pieces of apparatus, we put on surgical masks, gowns, caps, and white elogs in readiners to enter the operating theatre. In this hospital there were five such theatres, and I chose to enter one in which an operation was to be performed for a cancer in the mediastinum. The surgeons and doctors nearly all spoke English so we were invited to ask questions at any time. After watching the anaesthetist at work for a while I had to attend a lecture, and when I returned the operation was in progress. This was an unusual case. The patient was found to have two phrenic nerves supplying the right side of the diaphragm, instead of only one, and in order to record this anomaly cameras were set up in the centre of



— THE HARBOUR — SKIVE

— T.B. SANATORIUM — SKIVE

— FERRY BOAT — MOLS

the lamp directly above the operating table and photographs taken. Several other surgeons and doctors in the hospital also came to have a look. In the afternoon a visit to a T.B. clinic had been arranged. A reception was followed by a tour of inspection of the various departments: one of the most interesting features being a huge wall map of Aarhus and the surrounding district. In it were placed pins to indicate the home of every person who was known to have TB now or at some time in the past. The colour of the pin indicated the year the year in which the case had been identified. This map helps a careful check to be kept on any particular area, to make certain that the disease has not been spread.

On Tuesday a similar visit was paid to the Risikov Asylum. In an introductory lecture Professor Strömgen outlined for us the various classes of patient being helped here, and went on to give a brief account of the work carried out in the field of mental illness in Denmark. The patient with a psychosis is changed in personality and may not realise he is ill, whereas one with a neurosis has a disease, which whilst causing partial disfunction will probably leave the patient aware that he is ill. Both these diseases may be only temporary but ~~psychopathic~~^{psychopathic} and mental defective patients are usually in this condition for the whole of their life due to the disease being congenital. The professor went on to say that between ten and twelve per cent of the population, may at some time during their life become in need of care, due to mental illness of one kind or another. The actual congenital mental defective cases are cared for in a special hospital and the necessity of separating patients with different types of mental disease was emphasised. In Copenhagen all mental patients requiring only a short period of treatment, except the mental defectives, are treated in a general hospital; but throughout the rest of the country such cases go direct to a State Mental Hospital. As well as these hospitals, there is in North Zealand a special hospital for some six hundred epileptics, and another for criminal psychopaths in Copenhagen. The Risikov Asylum controls about 1,500 patients, of which some 300, having been treated in the hospital, are now on probation; boarded in private families prior to being completely discharged. There are here, child clinics and out-patient departments as well as clinics for alcoholics and mental hygiene. An electric-shock treatment is used on outpatients suffering

depressions, though at first its use was not favoured, but became necessary because of the shortage in the numbers of hospital beds available. The institute of brain pathology for the whole of Denmark is also situated here. This hospital has 35 wards; some open, some closed. The closed wards are for patients who cannot realise that they must stay in hospital, though very few are dangerous, and it would be difficult to realise in a short conversation with these patients that they are abnormal. Occupational therapy is used extensively, and we saw some of the patients at work making furniture, baskets and jewellery. There are in the hospital, many more chronic patients than one would see in a general hospital. This is because, if the surgeon cannot cure them, they either die or are sent home well again but here in Rindkov are patients who cannot get well but cannot be allowed out. However, about 75% of cases are discharged within three months of admittance and 90% within nine months. Here is a table showing the percentage of cases suffering from the different classes of mental disease, which are admitted, together with a table showing the percentage of cases in each class, present in the hospital at any particular time.

DISEASE	% CROSS SECTION.	% ADMISSION.
General Paresis	3	2
Senile	1	5
Other organic diseases	3	4
Schizophrenic	52	3
Manic depressive	18	21
Psyco-genetic	6	16
Neuroses	2	12
Psyco-path	4	13
Alcoholic	>1	4
Narcotainetic	1	4
Forensic	<1	3
Mentally defective.	3	4

The manic depression does not last long, therefore the patient stays only a short time in hospital, but the Schizophrenic often becomes ill before he is thirty years old and stays most of his life in hospital.

The tour of the hospital ended with a visit to the museum where

— GRUNDTVIG'S CHURCH — COPENHAGEN



— THE NAVE —

we saw paintings and models made by the patients, which were often typical of their mental condition.

The lectures during the last week of our stay were as interesting as those which we had already attended. In the first lecture on Monday, Doctor Ethelberg considered the effects of traumatic lesions of the brain under three headings: (i) Clinical aspects (ii) Physical features (iii) Therapeutic measures. He began by classifying the types of injury.

Concussion: - The person is unconscious seconds or minutes, exhibits a loss of muscle control, and when he comes round has a feeling of sickness and can remember nothing which happened a few minutes before the injury.

Subconcussion: - Subject doesn't fall, but sags at the knees, has a pseudo sensation of taste but not of smell. He can appreciate the event and realizes that there is nothing to taste. This subconcussion often occurs 4-6 hours after it was caused.

The doctor went on to tell us that after a severe traumatic lesion the patient may be unconscious for days or weeks, bruising of the skin is evident, and as the brain is oedematous, it favours the brain being pushed out through any hole which may be present. There is a danger of a chronic subdural haematoma caused by blood from small veins clotting.

In the study of cerebral concussion much controversy has arisen regarding the cause. As death can ensue without bruising or breaking the skin, then it cannot be always due to a direct blow. As a result of research the doctor told us that these various facts have been discovered: -

(i) There is a difference between the effect of a blow to a head which is fixed, and that to a head which is freely movable.
(ii) There is no generalised ischaemia from a blow to the head.
(iii) Although the pressure inside the skull may at the moment of impact reach 4,000 mm. of water, it is improbable, and even if it does it is only for about $\frac{1}{1000}$ of a second; therefore it cannot be a great factor in slowing the blood flow. Doctor Ethelberg concluded his most interesting lecture by giving us a description of the two main types of head injury their cause and effect.

(i) Due to a blow on the skull shock waves and sound waves are set up: these are not in phase and therefore cancel each other out. The shock



— COPENHAGEN —



— THE ENGLISH CHURCH —

strain is greatest at the point of impact and may result in a tearing down of the dura mater of the brain. The shear strain is greatest after a blow to the temporal or occipital region as in these regions the brain is most filled out, and therefore greatest damage is done.

(e) A blow upwards and side ways to the chin affects the midbrain, mainly at its junction with the diencephalon. These linear blows would be unimportant if it were not for the shear strains which they set up round the foramina, through which the brain stem and cranial nerves pass.

As I have already mentioned, I had to miss the second lecture on biochemical genetics due to the fact that I was in the surgical ward on Monday, but on Tuesday. The absorption of monosaccharides was the subject of an extremely useful lecture. The lecturer outlined the chief factors influencing both active and passive absorption and gave some idea of the percentage monosaccharide absorbed by each method.

The final lecture which I attended was given by Doctor Kresneyr Nielsen on Tuesday morning August 28th; the subject - "Blood platelets and their origin." After examining the various theories to explain the origin of blood platelets, which have been put forward since platelets were first described in 1842 by Donney, Wright's theory, the most generally accepted today, was described. We were told how he discovered that the megakaryocytes of the blood disintegrate into portions identical with platelets, but how haematologists would not admit that he was right until about 1930; nearly twenty years after he had published his findings. The most important factor influencing this change of attitude by the haematologists, was the new invital technique first used by Aronkin in 1929 for obtaining fresh bone marrow from the sternum to make smears for examination. This technique did away with the need for strong fixatives, and hence lessened the chance of artifacts occurring.

As I have said throughout this narrative, the lectures gave to us material which was at the same time both interesting and useful, whilst all the time speaking so fluently a language not their own. For all their patience and the trouble they took to make friends with us, I should like here to pay tribute to them.

And now to Copenhagen.

On Tuesday night, after the farewell dance, a small group of



— TIVOLI GARDENS —



— KRONBORG CASTLE —

was hurried to the quay in time to board the steamship ~~was~~ ^{was} sailing for Copenhagen. At 12 o'clock midnight, we could hear the cathedral chimes, as the ship slowly got underway. Though we were to return again in two days time, one could not help feeling that this was really goodbye. The lights of the city stretched along the shore as far as one could see, and in the centre, the pinnacle of the cathedral spire pointed like a green arrow head toward the sky. Silently, small fishing craft slipped by in the night, heading toward the welcoming beacon at the harbour mouth. After watching the moon come out from behind the cloud-flecked sky and the lights of the city disappear over the stern, we went below to our cabins.

The following morning I was awake early, and on deck, but unable to see the castle of Kronborg as we steamed through the Öre Sound, with the city of Malmö, Sweden, to port and Elsinore, Denmark, to starboard, separated by a mere two and a half miles of water.

We docked at 7:30 am. and after leaving our luggage at the student hostel, we set off to explore the town. The first port of call was the tourist bureau where we looked for the tour and collected brochures explaining, where to go, and what to do, in Copenhagen. We were only here for two days and meant to make the most of our time. In the morning we shopped and went to see the changing of the guard at noon in the fore court of Amalienborg Palace. Then after a hasty lunch we went on a conducted coach tour of the city. With the little time at our disposal, we had decided that this was by far the best way of seeing as much as possible. The coach left the Town Hall at 1:30, and in two and a half hours we saw over forty places of interest. The guide explained the various sights in four different languages. At Grundtvig's Church, we stopped and looked round this wonderful building. Its pure gothic arches and organ facade, made it stand out as one of the highlights of the tour. We were also very interested in the new University. A visit to Copenhagen would not be complete without seeing the mermaid statue created by Edvard Eriksen, who was inspired by Hans Andersen's fairy tale of the same name; and so a stop was made to allow us to take photographs. Altogether this tour was very much worth while. The evening we spent in the Tivoli Gardens, where tourists from every corner of the globe seem to congregate. After dinner, in the pagoda, we walked through the gardens

— FREDERIKSBORG CASTLE —



— THE CHAPEL —

admiring the multi-colored fountains and listening to the music of the orchestras; and there, watching the fire works, I met a fellow medical student from Liverpool. That afternoon I had also met another Liverpool student, a young lady, who was helping with the catering at the student's hotel. About midnight we returned to the hotel where we spent the night in what is a school during term time. We slept in tiered bunks, in what will now be the gymnasium, but then it was partitioned into small rooms by wooden screens; each 'room' containing twelve bunks in four banks of three.

The following morning at 10.0 am. the coach left the town hall on a tour of North Zealand. This time all the passengers understood English so that the guide was able to explain a good deal more about each place. The journey took us through the extensive beech forests beside the northern lakes to visit Sorgenfri Palace, the home of the King's brother, in the garden city of Lyngby. There was a stop at the open air museum consisting of old farm houses and mills, which have been assembled in the Fribohm-museet to represent Danish agricultural life in bygone days; and as we passed the vicarage of Bloustrød we saw a stork resting on the roof.

In Frederiksborg Castle we went on a conducted tour of what is now a vast national museum containing sculpture and art treasures. Each room is arranged to simulate the arrangement at a particular period of history, and the rooms represent periods almost to the present day. The Royal Chapel was most impressive. On the walls were the coats of arms of each member of Denmark's oldest orders of chivalry - the order of the elephant, and included those of Queen Elizabeth and the Duke of Edinburgh, Sir Winston Churchill, Viscount Montgomery, and President Eisenhower.

At Fredensborg Palace, a stop was made to visit this summer residence of the Royal Family, and to see a little of the park. But no tour of the castles of North Zealand would be complete without a visit to Kronborg (Hamlet's) Castle, at the town of Elsinore. Here, along the battlements was a battery of cannon, facing out across the Sound. This is the place, even in Shakespeare's play, the ghost of Hamlet's father appears, and one could imagine just such a scene occurring.

The tour ended with a drive back to the city, through fishing villages and seaside resorts, along the coast road running along the shores of the Sound, through the Danish Riviera, where hotels built to modern designs grace the

sea front. In Helsingør we passed the great Tivoli buscases and were in the city again by five o'clock.

After dinner we paid another visit to Trivoli with some of our friends, who had just crossed from Aarhus the night before. After another lovely evening we met Ebbe, the Danish student who had organized the course for us in Aarhus. Then, good byes were said to friends who were going to Norway or Sweden or who were to fly home or sail from Odense. A policeman at the office in Trivoli very kindly typed a short message for me in Danish, which I was to give to the train conductor who would then put us off at the nearest point to the boat leaving for Aarhus. By 11:10 pm we were safely on board, and again, as before, we stayed on deck reminiscing on the good times we had had until we were well through the Öre Sound. From now on it was one long journey. Arriving at Aarhus at 7:30 am on Friday we hastily bought food for the journey and last minute presents; and by 11:15 were saying good byes again to other friends, who had come to see us off. Two-fifty-five Fredicia - just time to go into the town for our last Danish meal - a mixed grill served piping hot; still in the frying pan for us to help ourselves. Then on again to Padborg, and one mad rush to spend any remaining Danish coins we had on hot dogs, lemonade, and the like. So, into Germany and through the Ruhr as we settled down for another sleepless night.

Emstham, Hamburg, Bremen, Essen; the corridors quickly becoming crowded, we were thankful for the comparative comfort of the compartment. Speeding on we reached Brussels by 7:30 on Saturday morning after a night in which hamburgers and lemonade were quickly followed at intervals by apples, figs, sandwiches, cakes and biscuits, as eating seemed to be the only thing to do, as it was impossible to sleep. By 9:0 we were in Ostend, that is, we, minus a mountain of orange peel, sweet papers, paper bags, lemonade bottles and waxed cartons which a cleaner was vainly attempting to reduce as she did her rounds about every two hours.

The crossing was rough and the boat crowded, so much so, that after a four hour trip it took seventy minutes before everyone had left the ship at Dover; and we, being last, just managed to catch the last boat train after little trouble passing through customs. In

London at 5:25pm there were more goodbyes as the party of seven broke up. For many, this was the end of the journey; but a few, like myself, had yet to face another sleepless night. After a meal, the first since I had left Denmark, I caught the 9:30pm night coach. The journey was much the same as the one going except that I was more tired and not much interested in whether we stopped or not. Fortunately I did not have to change until I arrived in Kendal at 9.0am. the following morning, and after an hour's wait, I was on the last lap. Home in time for dinner.

Now, after a few nights' good sleep, I can look back and say, as one of our party said just after crossing the German frontier:

"Well if this is Denmark I like it."

Yes, we did like it, we liked the friendly helpfulness of the Danes who advised us where to go, and what to see, and in a hundred different ways made our holiday. So I should like to thank them all, including Ebbe and Carl, our fellow medical students, in Aarhus, the lecturers, the organisers, and the man in the street - the Dane. Last but not least I should like to thank those who made my visit possible. I enjoyed myself very much, I met the Danes, I learnt a lot. This is the account of my visit. I hope that they will think their money was not wasted.