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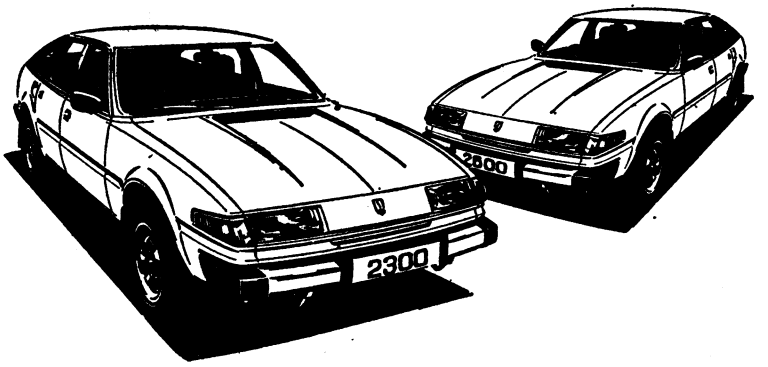

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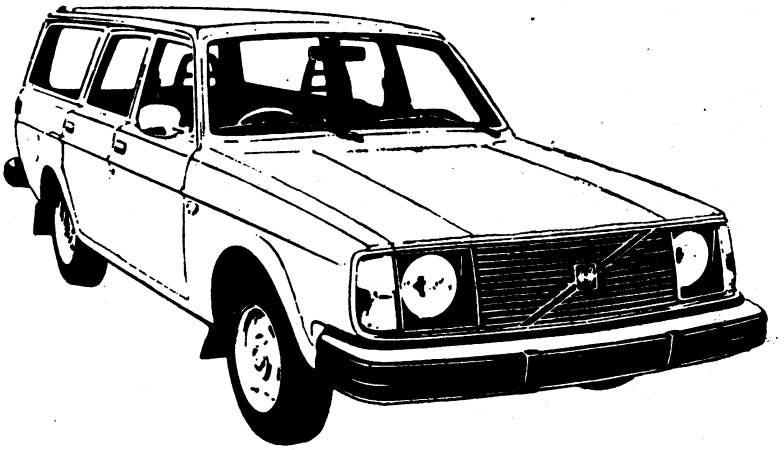

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THE ULSTER MEDICAL SOCIETY

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MEDICAL ASPECTS OF THE FIRST RECORDED CELTIC INVASION OF ULSTER (THE TAIN)

by

H. W. GALLAGHER

BASED ON PRESIDENTIAL ADDRESS TO THE ULSTER MEDICAL SOCIETY ON 20th OCTOBER 1977

THE oldest non-ecclesiastical manuscript in Ireland is the Lebor na hUidre (lour na heera) or Book of the Dun Cow. It contains part of the Táin Bo Cuailnge (Tawn Bo Kool-nje) or Cattle Raid of Cooley which describes the invasion of Ulster by the combined forces of the three other provinces to capture the Brown Bull of Cooley. The Cooley peninsula is the tongue of land between Carlingford Lough and Dundalk Bay. Two thousand years ago, when the invasion occurred, Ulster extended southwards to the river Boyne so that the Cooley Peninsula was well within Ulster territory.

THE TEXTS

The Book of the Dun Cow (now in the Royal Irish Academy, Dublin) was compiled prior to 1106 from manuscripts whose language dates them at about the sixth century and Dr. Ian Adamson (1974), a Fellow of this Society, suggests that the story was first committed to writing in the monastery at Bangor, Co. Down. A more complete version of the story is included in The Book of Leinster (now in Trinity College, Dublin) which was also compiled in the early twelfth century. The monk who wrote it did not think highly of the contents and added his own comments at the end: "But I who have written this story, or rather this fable, give no credence to the various incidents related in it. For some things in it are the deceptions of demons, others poetic figments, some are probable; others improbable; while still others are intended for the delectation of foolish men" (O'Rahilly, 1967). I think that we will find that he was writing more truth than he suspected and that through his writings we can gain a view, admittedly a lay-man's view, of medical practice in Ireland 2,000 years ago.

One may be tempted to argue that what was first written 600 years after the event could not possibly give a true picture of the event, but surprisingly John M. Allegro (1970), the internationally recognised authority on philology and well known for his work on the Dead Sea Scrolls, states: "Happily oral traditions are not so susceptible to change as those which are passed on by the written word." So it is possible that through the Táin we can gain some knowledge of medical practice of the Celts, but I do not want to confine myself too rigidly within a medical framework.

THE TRANSLATIONS

Not being a Celtic scholar, I cannot pretend that this is a work of scholarship. All I can attempt is to look at various translations and pick out incidents of medical interest which are surprisingly numerous. A cursory glance at the facsimile reproductions of some pages of the two books, reproduced by Sir Henry James by a combination of photography and colour printing and published in 1874, explains why different translators have produced different results. Except when quoting from specific translators I shall use the nomenclature introduced by Kinsella (1970), whose translation is scholarly, readable and has the advantage of being illustrated by Louis Le Brocquy. All quotations, unless otherwise specified, are taken from Kinsella's "The Táin".

The cattle raid is only one incident in the story of Ulster and her warriors, who were known as Warriors of the Red Branch. This "Ulster Cycle" is the mine from which a large number of stories has been taken, including the "Lays of The Red Branch" by Sir Samuel Ferguson (1897), who has been acclaimed as Ulster's premier narrative poet, but whose lyric "The Lark in the Clear Air" has become one of our most popular 'traditional' songs.

IRELAND TWO THOUSAND YEARS AGO

As already indicated, Ireland was divided into four provinces. Medb (Mayv) was Queen of Connacht with her consort Ailill. Her capital was at Cruachan, now known as Rath Croghan, Co. Roscommon. Conchobar (Conor) was King of Ulster, with his capital at Emain Macha (Ayvin Macha), now known as Navan Fort, which lies a few miles west of the city of Armagh. Territorially Ulster was at its zenith. Her traditional boundary was the huge earth-work, the Black Pig's Dyke, running westwards from the large circular rampart known as the Dorsey or Doorway, which is located south-west of Slieve Gullion near present-day Crossmaglen.

Sualdam (Sooaldav) was King of the plain of Murtheimne (Moor-tev-ne), which is the area around present-day Dundalk. He was married to Conchobar's sister and was nominal father of Cuchulainn (Koohullin), the hero of our story. There was also a suggestion that Cuchulainn was the product of an incestuous relationship between Conchobar and his sister and another version of the story is that his father was Lugh (Loo), one of a very large pantheon of Celtic gods. The largest collection of images of these gods is in the Protestant Cathedral in Armagh, where they are euphemistically known as grotesque figures. We still remember Lugh in an annual festival which has degenerated from a mass, the Lughmass or Lammass, to the Auld Lammas Fair at Ballycastle.

THE INHABITANTS OF ULSTER

Celts had been invading Ireland for about 500 years (Neeson, 1965) and were the overlords of the pre-existing peoples who had themselves invaded our island thousands of years previously. The first invaders were giant mesolithic hunters, followed by small agile neolithic farmers. These two groups are probably the only pure races ever to invade Ireland and they have left their traces in our genetic pool. The rugby field provides an excellent illustration—Willie John McBride would seem to be the lineal descendant of the mesolithic hunter and those of my generation will remember the gallant George Cromie, who was probably the smallest descendant of the neolithic farmers ever to don the green shirt for Ireland. In the Táin the inhabitants of Ulster who were present before the arrival of the Celts known as the Ulad are called Picts. Duff (1953) and Adamson (1974) identify them as the Cruthin, "the most ancient inhabitants of Britain and Ireland to whom a definite name can be given". Duff states that their capital was at Mount Sandel near Coleraine. The Picts possibly were a mixture of mesolithic, neolithic and Celtic invaders who had reached Ulster before the Ulad.

There seems to have been very little difference between Pict and Celt or Cruthin and Ulad. Both were tabu-ridden head-hunters who, whatever their relationships had been before the threat of invasion, were united in resisting it. In The Yellow Book of Slane (James, 1874) and in Cuchulain of Muirthemne—the translation of all the stories dealing with Cuchu'lainn by Lady Gregory (1912)—there are definite suggestions of cannibalism, and Frazer in the Golden Bough supports this interpretation especially as regards the drinking of human blood.

The Táin marks the beginning of the relentless pressure of the Gaels on Ulster which continued for the succeeding five centuries during which the Ulad were absorbed by the Cruthin. Eventually they emigrated to Scotland and a thousand years later their descendants returned from Lowland Scotland to stamp their personality on this province in the plantation of Ulster (Adamson, 1974).

THE PILLOW TALK

Medb and Ailil were for once occupying the same bed in Cruachan. That seems a strange statement to make about husband and wife, but Medb, on her own admission, was a nymphomaniac. She claimed that for all her married life she had at least one lover and for each lover there was at least one more waiting to take his place. The pair started arguing as to which had brought most to the family home and tempers rose as each article of furniture, clothing or jewellery produced by one was equalled by the other. At last Ailill produced his magnificent white bull at the head of his herd of cows and heifers. Medb had to admit defeat but resolved to get for herself the Brown Bull of Cooley which was at least the equal of the White Bull of Connacht.

By fair means or foul she induced the other provinces to join this hosting to capture the Brown Bull. Wealth in those days was on the hoof and if all the rest of the men of Ireland expected worthwhile pickings, Ulster's wealth must have been very great. The armies assembled on the plain of Magh Ai (Mahee) near Cruachan and were placed under the supreme command of Fergus, ex-King of Ulster. The explanation of that strange fact, although not why he lost his throne, is to be found in the story of Derdriu (Der-dru) and the sons of Uisliu (Ishlu).

DERDRIU OF THE SORROWS

The sad story of Derdriu is one of the stories of the Ulster Cycle which is well known, but it is not so well known that she cried in the womb at the onset of labour.

"The men of Ulster were drinking in the house of Fedlmid (Fe-lim-i) . . . His wife was overseeing everything and looking after them all. She was full with child. Meat and drink were passed around, and a drunken uproar shook the place. When they were ready to sleep the woman went to her bed. As she crossed the floor of the house the child screamed in her womb and was heard all over the enclosure. At that scream everyone in the house started up . . ."

When I first read that I agreed with the scribe who had written the Book of Leinster and had advised his readers not to believe a word of what he had written! However, on enquiring from my obstetric colleague, Dr. H. Ferris, I found that in this instance my incredulity was ill-founded. Foetal crying has been heard on several occasions in Ards hospital, once necessitating Dr. Ferris's hurried departure from church to deliver a second twin. He tells me that it is not necessarily a sign of foetal distress but does indicate the need to expedite delivery.

Derdriu, a beautiful girl, was reared in isolation and was intended to be Conchobar's bride. She fell in love and eloped with Noisiu (Noyshu), one of the sons of Uisliu (Usnach, according to other translators). The lovers and Noisiu's two brothers and their retainers fled from Conchobar's wrath and ended up in Alba. The three sons of Uisliu were mighty men of valour and were badly misssed by the other warriors of the Red Branch who wanted Conchobar to forgive Derdriu and bring back the sons of Uisliu to help in the defence of Ulster.

At last Conchobar agreed and sent Fergus, who was recognised by all as a man of honour, to bring the wanderers home. Derdriu did not believe that Conchobar could ever forgive and forget, but her fears were overruled by her husband and brothers-in-law. The party set sail for Ulster, probably aiming for Dunseverick which was then the trading port between Ulster and Alba. They were blown off course and landed near Ballycastle at a sloping rock, "still known as Carrig Usnach" (Garrett, 1968). On the headland just above Carrig Usnach is Corrymeela, that modern symbol of reconciliation, but, as we all know, Derdriu's homecoming was not for reconciliation.

On arrival in Ulster, Fergus received an invitation to a banquet in Dunseverick. He was under geasa (gasa) or tabu never to refuse such an invitation and, although doubts about Conchobar's trustworthiness assailed him, he had to accept. Derdriu and the sons of Uisliu had to press on to Emain Macha because they had put themselves under tabu not to eat in Ulster until they sat down with Conchobar at a meal to celebrate their forgiveness and reconciliation. Conchobar had planned differently and had mercenaries ready to kill all three brothers. Contrary to James Stephens' retelling of the story, Derdriu did not die of grief but lived in sorrow for a year during which she resisted all Conchobar's advances. She then killed herself in the first road traffic accident recorded in Ireland. Conchobar had given her as a concubine to Owen, one of his cronies, and as he was bringing her away in a chariot—but here Mary Hutton can take up the story:

"There was a cliff of stone against the way;
She threw her head against the cliff of stone
So that she made bruised fragments of her head,
And she was dead."

There is a suddenness and finality and economy of words in that reporting which we do not get to-day.

Fergus and many others of the Red Branch Warriors were so enraged by Conchobar's duplicity that they rebelled and burnt Emain Macha to the ground. The person of the king was sacred so they could do no more, but they left Ulster and became mercenaries for Medb in the same way as Uriah entered the service of David after the fall of the Hittite Empire. Recent excavation at Emain Macha (Navan Fort) by Dr. Dudley Waterman (Harrison, 1976) has revealed evidence of a huge conflagration which can be dated to about 265 B.C. This, if it is the same destruction as caused by Fergus, would put back the story of the Táin by abut 300 years, but that is as nothing compared to the 2,000 years which recent excavations in Syria have suggested should be added to the generally accepted date of Abraham (Magnusson, 1977).

THE PANGS

After that long flash-back, we return to the armies on their invasion route, which, as already explained, had to be more or less due east to get to the Dorsey, west of Slieve Gullion or to the Pass of the North, east of the mountain, through which the main Belfast to Dublin road and railway now run. Medb was hopeful for rapid success because her spies had brought back news that Conchobar and his warriors were laid low by a recurring illness known as 'the pangs', which can only be explained by another long flash-back.

The whole story is too long to quote, but, in brief, a fair was being held in Ulster and a woman in advanced pregnancy was forced to race against the king's chariot. "She called out to the crowd, 'Help me! Wait till my child is born.' But she couldn't move them. 'Very well,' she said, 'a long lasting evil will come out of this on the whole of Ulster.' 'What is your name?' the king said. 'My name and the name of my offspring,' she said, 'will be given to this place. I am Macha, daughter of Sainrith Mac Imbaith' (Sanrith MacIvith). Then she raced the chariot. As the chariot reached the end of the field, she gave birth alongside it. She bore twins, a son and a daughter. The name Emain Macha, the Twins of Macha, comes from this. As she gave birth she screamed out that all who heard that scream would suffer from the same pangs for five days and four nights in their times of greatest difficulty. This affliction, ever afterward, seized all the men of Ulster who were there that day, and nine generations after them."

This explanation of the 'pangs', which, as we will learn, prevented the Red Branch Warriors going to the help of Cuchulainn from Autumn to Spring, raises more questions than it answers. How did five days and four nights become extended to months? Did Cuchulainn's vigil at the ford last only a five-day week and over the succeeding centuries did days become extended to months? We do not know, but the whole description suggests a psychological rather than a physical

illness. Some authorities suggest that it is based on the practice known as couvade, in which, in some primitive tribes, the father has the pains while the mother has the child. But this does not correspond with the description of Derdriu's birth, during which her father was roistering along with the other warriors.

There is another clue in the description of Medb's raid up to Dunseverick which occurs later on in the story. She and her warriors were careful only to kill and capture women and children because if any of the stricken warriors were killed their illness would have been transferred to the killer. So it was an infectious disease and yet Sualdam and Cuchulainn were immune. We have seen the power of tabu repeatedly in the daily life of these people and must conclude that this illness was mass hysteria and Sualdam and Cuchulainn were immune because they were not of the Ulad. Cuchulainn's wife, Emer (Ay-ver), who was not of Ulster stock, thought it was even worse than hysteria; she accused them of malingering—"shamming the travail of women" (Henderson, 1899). All those who have done any medico-legal work will agree that the dividing line between the two conditions can be very blurred, but I think we should give them the benefit of the doubt and call the illness mass hysteria.

The Macha of Emain Macha, or of the present Armagh, is not the princess who sits patiently outside Altnagelvin Hospital in Londonderry. She is a very shadowy creature also known as Macha of the Golden Hair, who is credited with the foundation of the Broin Bhearg (Braun Varg), the sick bay or hospital which was in use in Emain Macha for 600 years.

CUCHULAINN

Fergus warned Medb not to be hopeful of easy success because they had to pass across the plain of Murtheimne near Dundalk where Cuchulainn and his father were not affected by the pangs. At first Medb would not believe that Cuchulainn, a mere youth of 17 years, could be anything other than a fly to be brushed aside. This gives Fergus an opportunity to describe the life and prowess of Cuchulainn.

Cuchulainn very early in life went to Emain Macha to join his uncle's court and to receive his education. Education among the Celts seems to have been a matter of sending children to family after family as foster-sons to learn the specific art for which that family was famous, be it swordplay, throwing the javelin or even the art of hospitality. This custom also undoubtedly cemented the bonds of kinship and I am glad to be able to find a medical reason to refer to it. Today fosterage involves the services of at least a medical social worker and that is excuse enough for me to quote Mary Hutton:

> "Blai (Blaw), the lord of lands
> Of Tara in the Ards of Ulster, took me
> Because of the close kinship of his race:
> So that I got my due of wealth with him,
> And learnt the way to entertain the men
> Of Ulster, for the week of entertainment,
> Together with their king, red-sworded Conor."

Tara Cottage, where I now live, is tucked between the sea and Tara Hill. My previous home not only had the name Cruachan on the gate when I bought it but was also so named in the title deeds. It was this coincidence which stimulated my interest in the story of Medb and Cuchulainn.

There is another Cruachan quite close to Tara Hill. It has been Christianised by the addition of the name "Cooey", who will be mentioned later. According to James Shanks of Ballyfounder, an antiquarian of a former generation who lived in the shadow of Tara Hill, the words Tara and Cruachan had extra connotations in addition to their literal meanings—Tara, literally a high place, was the official residence of the king; and Cruachan, literally a little round hill, was the unofficial residence or family home (Rutherford, 1913).

Tara Hill is crowned by Tara Fort or Forth, which undoubtedly is the remains of a fortified Celtic homestead—the seat of the local king or chieftain. It has never been excavated but, according to Lady Gregory, the standard of living in these Celtic houses was very high: "There were a hundred tables of white silver in it, and three hundred of brass, and three hundred of white bronze. And there were thirty vessels with pure silver from Spain on their rims, and two hundred cowhorns ornamented with gold or silver, and thirty silver cups, and thirty brass cups, and on the wall there were hangings of white linen with wonderful figures worked on them."

The gold ornaments in the Ulster, Irish and British Museums, and especially the bronze mirror and pair of bronze flagons in the British Museum, support Lady Gregory's statements, but there is a great discrepancy between the standard of metal work and the architecture of the Celts. Archaeology has shown that the houses were of wood and wattle with a hole in the thatched roof for the escape of smoke from an open fire in the centre of the room. If there is less gold, silver and bronze in Tara Cottage than there ever was in Tara Forth, there is at least less smoke!

AUTONOMIC NERVOUS SYSTEM

When Cuchulainn's battle-fury was aroused and the sympathetic system took control, a handsome stripling was converted to a veritable ogre. "Thereupon contortions took hold of him. Thou wouldst have weened it was a hammering wherewith each hair was hammered into his head, with such an uprising it rose. . . . He closed one of his eyes so that it was no wider than the eye of a needle. He opened the other wide so that it was as big as the mouth of a mead cup. He stretched his mouth from his jaw bones to his ears! He opened his mouth wide to his jaw so that his gullet was seen. The champion's light rose up from his crown" (Dunn, 1914).

It is impossible to explain all those phenomena by the outpouring of adrenalin and noradrenalin. But if the Celts knew nothing of the existence of either part of the autonomic nervous system, they recognised the power of the parasympathetic system over the sympathetic as the following incident shows.

On the first day Cuchulainn took up arms, he sallied forth to the perpetual look-out on Slieve Gullion near the Dorsey. Not seeing any enemies, he went

farther south and finally returned to Emain Macha with the heads of three enemies, a wild deer tethered between the rear shafts of his chariot and 20 swans fastened to his chariot with cords—fluttering above it like an array of modern two-string kites. Conchobar realised that in this state of elation Cuchulainn would not distinguish between friend and foe and would kill them all unless his battle-fever was quenched. " 'Let the young women go,' said Conchobar, 'and bare their breasts and their swelling bosoms, and if he be a true warrior he will not withstand being bound, and he shall be placed in a vat of cold water until his anger go from him' " (Dunn, 1914). This stratagem worked but it took three vats to cool him down properly!

Cuchulainn also realised the power of mind over matter and arranged with his charioteer that if ever his battle-prowess fell below normal he should upbraid him and revile him as a coward and wastrel until his temper was properly aroused and the adrenalin and noradrenalin started flowing freely again.

THE HERO LIGHT OR HALO

It was a widespread belief among the Celts that heroes and demi-gods emanated a supernatural light and that they were invincible to ordinary warriors. A Roman general made great use of this belief by adapting the helmets of his troops to contain a torch and therefore they became invincible to the ordinary Gael or Celt. (I have been unable to find documentary evidence for this statement.) An Edwardian artist, Stephen Reid, interprets the champion's light on Cuchulainn as a halo, similar to the halo of religious art (Hull, 1909).

The words halo, nimbus and aureole, which can all mean the same thing, did not enter the English language until the seventeenth century. Originally the halo was part of the insignia of the sun god—Helios or Apollo—and some of the pagan Roman emperors who were deified had halos added to their portraits. It is not surprising that in Christian art in pagan Rome the halo is absent. Constantine made Christianity the official religion of the Empire and in 323 transferred the capital to Byzantium (Constantinople), which was very near to Galatia, whose inhabitants were Celts. Some Galatians had been converted by Paul in the first century but the majority presumably retained their Celtic traditions until and after Christianity was forced upon them. Is it too fanciful to suggest that it was their influence which Christianised the halo in the middle of the fourth century? Hall's "Dictionary of Subjects and Symbols in Art" states that the halo was not used as a sign of divinity in Christian art until the fifth century, but in the recent exhibition of Roman gold and silver in the British Museum there was on view a silver dish, made in the mid-fourth century, bearing the portrait of Constantius II complete with halo. He was one of the triumvirate who succeeded Constantine and was head of the Church as well as being Emperor. There is no doubt in my mind that his head is encircled by a halo, but this feature is not mentioned by Kent and Painter (1977) in the descriptive catalogue.

The usual explanation for the existence of the halo is that some people actually see a halo of different colour around the head of each living person. This would explain the existence of the halo, but not its application only to holy or

divine persons. I know a nurse who is one of these 'para-normal' people and when she found that she is apparently unique she was so upset that she will not even discuss the subject. One point of interest is that both her father and she can generate sufficient static electricity that shaking hands with them may at times be hazardous. She has to be very careful to discharge her static electricity before touching a patient, but she has one advantage over the medical profession—she is first to know when a patient is dead.

HYGIENE

It is not surprising that the hero Cuchulainn was able to instil fear into the invaders, and by guerrilla tactics, feats of strength and the tabu that went with them, he was able to halt them. This then is an opportune moment to look at the hygiene of a Celtic army—not that the scribe has any heading so named—but by inference we learn that they did not build latrines but they had to go outside the confines of the camp to attend to the calls of nature—all except Medb. Such petty restrictions did not apply to her—she just used the floor of her tent!

Like many another army, the invaders became lousy and Cuchulainn was also infected, presumably by stripping the armour from his victims. There is a pathetic portrait of him "squatting, haunch-deep in the snow, stripped and picking his shirt". I suppose the absence of separate night clothes was a factor predisposing to infestation and at least up to the time of the historical battle of Magh Rath (Moira) in 637 A.D. even the king slept naked (O'Donovan, 1842).

THE CAPTURE OF THE BULL

Knowing that Cuchulainn could not be in two places at the same time, Medb divided the army into two parts, one under the command of Ailill and the other under Fergus and herself. Ailill was suspicious of this arrangement and sent his charioteer to spy on Medb and Fergus. He had his suspicions confirmed when the charioteer caught them in the act of adultery. Ailill was not surprised. It was the price he reckoned that had to be paid to Fergus for his help.

Medb with part of the army carried out a raid as far as Dunseverick and returned with a great booty of cattle, women and children—to put them in their proper order of importance! On another foray the rough terrain of the Cooley peninsula was penetrated and the raiders returned in triumph with the Brown Bull.

This, one thinks, should have been the end of the war because Medb had achieved her object. But she was not satisfied and was intent on total victory. Finnabair (Finavir), her daughter, who had a very good reason to be disappointed that the war had not ended, asked her mother why she had this "marvellous hatred" of Ulster. She was told that it was "only natural to hate proud Ulster" and in any case she wanted to wreak her vengeance on Conchobar, who had raped her 25 years previously. When we think of Medb's self-confessed life-style, we must agree that this is an unlikely story and it is not surprising to learn from another source that at the time of the alleged rape Medb had killed her own sister Clothru, "and out of her sides, Furbaide (Furvaddy), son of Conchobar, was taken with the swords" (Henderson, 1899). This suggests that Conchobar had

resisted Medb's advances in favour of her sister Clothru and now Medb saw a chance of humbling him. Congreve sums it up:

"Heav'n has no rage, like love to hatred turn'd,
Nor Hell a fury, like a woman scorn'd."

SINGLE COMBAT

Cuchulainn, by skilful use of his sling both by day and by night, was killing large numbers of the invaders, so they were glad to make a pact with him that before they could advance farther Cuchulainn would have to be defeated in single combat. Cuchulainn, although he was severely wounded on many occasions, killed all comers till the Spring of the following year. Not only did he fight by day but he was on guard at night. Anyone who has suffered from insomnia or has had several consecutive sleepless nights for any reason will recognise the truth of the following description of the involuntary cat-naps which the insomniac cannot prevent: "For from the Monday before Samain (Savin—Summer's end) even unto the Wednesday after Spring beginning, Cuchulainn slept not for all that space, except for a brief snatch after mid-day, leaning against his spear, and his head on his fist, and his fist grasping his spear and his spear on his knee" (Dunn, 1914).

The end of each duel was decapitation, from which, of course, there was no recovery. Compound fracture of pelvis and long bones and ruptured liver and spleen and perineo-abdominal wounds were always fatal, but simple fracture of the skull and even penetrating wounds of abdomen and chest were not necessarily fatal even if the mesentery were ruptured. I think this is more a tribute to Celtic hyperbole than to medical skill!

UNARMED COMBAT

During the 1939-45 war, when training for unarmed combat became popular, I thought that something new had been discovered in the art of war, but there is nothing new under the sun. Cuchulainn was as expert in unarmed combat as with sling or lance.

A warrior named Larene (Lereeny) was chosen to meet Cuchulainn in single combat. His brother was a friend and foster-brother of Cuchulainn and knew that once Larene was killed he would be expected to avenge his death and therefore would himself be the next victim. He asked Cuchulainn to spare Larene's life and this Cuchulainn agreed to do and went unarmed into the battle. Dunn describes the encounter: "Cuchulainn ground and bruised Larene between his arms, he lashed him and clasped him, he squeezed him and shook him, so that he spilled all the dirt out of him, so that the ford was defiled with his dung and the air was fouled with his dust and an unclean filthy wrack of cloud arose in the four airs in which he was . . . From that time forth for the remainder of his life he never got up without a sigh and a groan, and he never lay down without a moan; as long as he lived he never ate a meal without a plaint, and never thence forward was he free from weakness of the loins and oppression of the chest and without cramps

and the frequent need which obliged him to go out", because, as Kinsella adds, "(he) could not empty his bowels properly." Rupture of both diaphragm and perineum would account for all four sets of symtoms—chest pain, abdominal cramps, frequency of micturition and incontinence of faeces.

FERDIA AT THE FORD

As warrior after warrior was killed by Cuchulainn, it became more and more difficult to get anyone to volunteer for the unequal combat. At last Ferdia (Fer-dee-a) was constrained to do battle with his friend and foster-brother. After three days of inconclusive duelling, Ferdia realised that the fourth day would bring either death or victory and he knew that if he appeared to be getting the upper hand Cuchulainn would use his secret weapon, the gae bolga (ga bulga). This was an underwater guided missile which never failed to find its target, euphemistically called the fundament, and on impact it burst into numerous barbs—a bit like an opening umbrella. The perineo-abdominal wound caused by this was inevitably fatal. The ford at which this battle was fought and in which Ferdia was killed became known as Ath (Awth) Ferdia, which in course of time has become contracted to Ardee.

For protection against this gae bolga Ferdia sewed a mill-stone into the skirt of his apron. The word mill-stone conjures up windmills with their massive granite mill-stones, but windmills were not introduced into Europe from Asia until the twelfth century (Gibbon, 1176-1787), and probably at a much later date into Ireland. The mill-stone used by Ferdia was probably the upper stone of a rotary hand-quern of the type still used in Connemara in the nineteenth century (Lyons, 1952). Mrs. Park of Newtownards has a very fine collection of these "fairy mill-stones". They vary in size from 8 to 20 inches (20 to 50 cms) in diameter, so it would be perfectly feasible to sew a small one into the skirt of an apron or the seat of a pair of breeches.

It is a pity that Ferdia is not credited with wearing breeches because breeches were a Celtic invention (Gibbon, 1776-1787). But, like all advances, they took a long time to reach Ireland. However, as late as the sixteenth century, during the English invasion of Ireland, an eyewitness distinguished the Irish from the English soldiers by the former wearing tight-fitting breeches and the latter trunken hose. The wood-cuts of John Derricke, who was on the staff of Sir Philip Sydney, do not differentiate very clearly between tight breeches and loose hose. He states, however, that the Irish were easily distinguishable because they wore a saffron coloured linen over-garment which came down to their knees (Small, 1883). This presumably is the forerunner of the saffron kilt.

Cuchulainn was severely wounded in this duel with Ferdia and was brought home to the plain of Murtheimne to bathe in its healing streams. His wounds were packed with sphagnum moss and protected from the irritation of his clothes by hoops of willow wands—surely the first reference to bed-cradles that we are likely to find.

ATTITUDE TO DEATH

In present-day society death is, or has been until recently, a tabu subject for polite conversation. This reflects a fear of death. We expect to be made better—no matter what our illness. We have not attained the philosophical composure of Sir Thomas Browne who in 1636 could write: "I boast nothing but plainly say, we all labour against our own cure, for death is the cure of all diseases" (Keynes, 1968). The Celts, like the Victorians, lived with death around the corner. What else could a head-hunting fraternity expect? Violent death was the order of the day and in the Annals of Ireland the death in his bed of any king was worthy of special mention. The Celtic warriors feared death but often went into battle with a complete disregard for their own safety, not bothering to wear armour or even clothes. They were fatalists—as most soldiers are.

When Ferdia had the premonition that his fight with Cuchulainn would be his last, Mary Hutton expresses his thoughts very well:

> " . . . and well we know
> What must be, must be, Man may not avoid
> His hour of birth, nor yet his hour of death;
> But he is driven and constrained to come
> Unto that sod where his last grave shall be."

Dr. Douglas Hyde (1901) gives the literal translation as: "A man is constrained to come unto the sod where his final grave shall be" and paraphrases it to:

> "O Cuchulain, fierce of fight,
> Man of wounds and man of might,
> Fate compelleth each to stir
> Moving towards his sepulchre."

Fatalism was not the sole cause of their bravery. Wagner (1971) states: "Celts are reported to have been highly religious people with a central belief in immortality and a happy life in another world after death, a belief from which their well-known bravery in war and disregard for death are derived."

In spite of the Celts' widely-held belief in reincarnation (Ross, 1975), I can find nothing in the Táin to support the neo-platonic interpretation which W. B. Yeats gives to the life and death of Cuchulainn (Raine, 1974). I am neither mystic nor poet, but I cannot help wondering what he would think of the "terrible beauty" which still stalks through our land 61 years after he saluted its birth.

In the Táin several warriors are described as going into battle naked and one of the vignettes is the description of an old naked warrior. The well-known statue 'The Dying Gaul' in the Museo Capitolino in Rome depicts the fallen figure of a naked warrior with a long trumpet and sword lying beside him. It was erected in the third century B.C. by Attalus I, King of Pergamon, to commemorate a resounding victory over the Celts or Gauls of neighbouring Galatia. Pergamon was the home of one of the churches reprimanded by the writer of the Apocalypse or Revelation of St. John the Divine. It was also the birthplace of Galen, who inherited a long tradition of healing because Pergamon had been a notable centre for the healing cult of Asklepios, who was worshipped as 'The Saviour'. The

title 'Saviour' is here used in its correct Greek sense as "saving from disease, harm, peril, etc., and is a common epithet of Zeus and kings" (Allegro, 1970).

Cartwright and Biddis (1972) claim that the phenomenal spread of Christianity in the Roman Empire in the first three centuries of this era was stimulated by its specific medical mission in a succession of plagues. "The miracles of Christ and the miraculous power entrusted by him to his followers were an earnest of divine intervention which might cure mortal sickness or defeat death itself . . . So was formed the cult of Christ the Healer."

PSYCHOGENIC SHOCK

After the duel between Cuchulainn and Ferdia the Ulster warriors recovered from their 'pangs' and some came on their own initiative to stem the invading host. Some were vanquished and some were bought off by various means. Rochad (Rochu), the most handsome of the Ulster warriors, came with 100 retainers and when Finnabair heard of his approach she confessed to her mother that he was "her true and first and chosen love"—a real Romeo and Juliet situation! " 'If you have so much love for him,' Ailill and Medb said, 'sleep with him tonight and ask him for a truce for our armies until he comes against us with Conchobar on the day of the great battle.' " When Finnabair returned to the camp the following morning she found that seven kings of Munster had rebelled because each of them agreed with their spokesman, who said: "That girl was promised to me, with fifteen hostages as a guarantee, to get me to join this army." The combined forces of Medb, Ailill and Fergus and the Galeoin (who seem to have been earlier inhabitants of the South, just as the Picts or Cruthin were the earlier inhabitants of the North) put down the rebellion with a total loss of 700 men. When Finnabair heard this, she fell dead of shame, or as O'Rahilly puts it: "Her heart cracked like a nut in her breast through shame and modesty." I suppose we must diagnose psychogenic shock as the cause of that death from natural causes.

BEDSIDE MANNER

In the days of the Táin it was the hallmark of a good physician to be able to diagnose a man's illness by the way the smoke arose from the hole in his roof, and after inspecting a wound he was expected to be able to state not only what weapon caused it but also who wielded the weapon. That, of course, we can put aside as nonsense, but Cethern's treatment by and of the physicians can teach us a lot.

Cethern, a renowned Ulster warrior, was one of those who recovered early from the 'pangs' and went to aid Cuchulainn and was himself gravely wounded. "He came back from the battle with his guts around his feet, and Cuchulainn pitied his wounds.

" 'Get me a healer,' Cethern said to Cuchulainn.
A bed of fresh rushes was fixed for him and a pillow.
. . . The first healer came up and examined him.
'You won't survive this,' he said.

" 'Then neither will you,' Cethern cried and struck him with his fist, and his brains splashed out through the seams of his skull and the windows of his ears (Dunn). He killed 50 healers . . . in the same way . . .

"Cuchulainn said to Cethern, 'You had no right to kill those healers . . .' 'They had no right to give me bad news' " was the reply.

Those 50 healers all made the same mistake—they gave a poor prognosis without even being asked, and, even worse, when a consultant was called in, they were proved wrong. I am all in favour of never telling a patient a lie, but we must remember that our diagnosis and prognosis may be wrong and as long as there is a ray of hope it must not be extinguished. Fortunately, if we do communicate bad news we are not likely to suffer the same fate as Cethern's first 50 physicians.

DIAGNOSIS AND TREATMENT

Fingin, the holy healer, the consultant, Conchobar's own physician, was next to be summoned to Cethern's bedside. He examined the wounds and said " 'They have cut the bloody sinews of your heart. It is rolling around inside you like a ball of wool in an empty bag' . . . After this the healer gave him a choice: either to treat his sickness for a whole year and live out his life's span, or get enough strength quickly, in three days and three nights, to fit him to fight his present enemies. He chose the second course. The healer asked Cuchulainn for bone marrow to heal him, and Cuchulainn . . . took what beasts he could find and made a mash of marrow out of their bones.

"Cethern slept day and night in the marrow, absorbing it. He said afterwards: 'I have no ribs left. Get me the ribs out of the chariot frame' . . . Cethern took his weapons and made off towards the armies, with the frame of his chariot bound around him to give him strength."

I think we can discount the guts around Cethern's feet as more Irish exaggeration, but the statement about absence of ribs and the use of the chariot frame as an abdominal and chest support surely makes the phrase about Cethern's heart rolling around like a ball of wool in an empty bag a very vivid description of a flail chest and mediastinal flutter.

MARROW BATHS

This healing by marrow bath is quite frequent in legendary Celtic lore, going back to Diancecht—the Irish Asklepios—and appearing as late as the twelfth century, by which time it had taken on a sacerdotal role. Giraldus Cambrensis, who accompanied Henry II on his subjugation of Ireland in the twelfth century, described the inauguration of The O'Donnell as the King of Tyrconnell at Doon Rock near Letterkenny as follows: "All being assembled on a hill, a white beast was brought before them, unto which he who was chosen as king, approaching, declared himself to be just such another (that is, a mere beast): whereupon the cow was cut in pieces, boiled in water, and a bath prepared for the new king of the broth, into which he entered publicly, and at once bathed and fed" (Anonymous, 1839).

This inauguration ceremony may have been completely pagan but the ceremony before the O'Donnell forces went into battle certainly was not. The Cathach was ceremoniously carried around the army in the hope that its power would be transferred to the soldiers. The Cathach is the Psalter surreptitiously copied by St Columba from that owned by another monk and it was the subject of the first copyright decision—"To each cow its calf, therefore to each book its copy." What is thought to be the original sixth century Cathach is one of the treasures in the Royal Irish Academy. The pagan inauguration rite was probably followed by a Christian ceremony and by the following century had been completely replaced by such a ceremony in the Abbey at Kilmacrenan (Byrne, 1973).

ST PATRICK AND THE SNAKES

The Gallaghers, or O'Gallaghers as they were then, played a leading part in this ceremony (Byrne, 1973) and for several centuries The O'Gallagher was the sub-chief and Marshal of The O'Donnell's forces. They were sufficiently important to have their own coat of arms which contains "a serpent in fess proper" and the crest is a "crescent gules, out of the horns a serpent erect proper" (MacLysacht, 1957).

It seems strange for an Irish sept to have serpents in its coat-of-arms—the dozen or so septs or families who have this mark of distinction must have been here before St Patrick, because, as we all know, he banished snakes from Ireland! It is easy to be facetious about this legend, but there may be more truth in it than is zoologically possible.

The statue of the 'Dying Gaul' to which I have already referred bears close inspection. On the ground before the eyes of the dying warrior there is a snake and surely a battlefield is the last place we would expect to find any wild animal, especially a snake. I suggest that we can interpret this best by comparing it with a similar but hypothetical memorial which Saladin I might have erected to commemorate a victory over the Crusaders. In front of the eyes of the dying Crusader would be a cross or a crucifix. We know that the snake was one of many animals revered by the Continental Celts and I am suggesting that it is here representing one of the Celtic Pantheon. MacCulloch (1911) identifies the snake as the emblem or even as the god of the underworld. The English Celts or, if that is too much a contradiction in terms, the Celts who inhabited Britain before the Roman Invasion, used the snake as a religious symbol and may well have worshipped it (Sharkey, 1975), and the Irish Celts probably did likewise. The snake, serpent or water-serpent appears frequently in Irish Celtic mythology and its banishment by St. Patrick was its suppression as an object of worship. Ross (1967) states that ". . . any lack of serpent lore in Ireland is due to the deliberate suppression of this sacred pagan animal on the part of the Church . . ." St Patrick's banishing of the snakes is therefore true in a mythological rather than a zoological sense.

HEALING WELLS

The sweat-houses of former centuries and the healing wells which are still with us in a Christianised form are in the same tradition as the marrow bath and I am

sure that it is no accident that there is a holy or healing well in the shadow of Doon Rock. St Cooey's wells outside Portaferry have recently been opened to the car-loving public at vast expense and rosary beads left on the thorn bush overhanging the well testify to its current use—carrying on a custom which is centuries old. St Cooey is the legendary saint of the Upper (Southern) Ards. The ruins of his church or temple, built beside the wells and reputedly going back to the seventh century, have been renovated and Mass was celebrated there in July last, probably for the first time since the eighteenth century.

MEDICAL CORPS

When the men of Ulster recovered from their illness they mobilised on the hill of Slane. The last troop to arrive was the Medical Corps. Medb's look-out described them: " 'Yet another company then came to the mound in Slane of Meath,' continued McRoth, 'a numberless bright-faced band; unwonted garments they wore; a little bag at the waist of each man of them. A white-haired, bull-faced man in front of that company; an eager, dragon-like eye in his head; a black flowing robe with edges of purple around him; a many-coloured leaf-shaped brooch with gems in the robe over his breast; a ribbed tunic of thread of gold around him; a short sword, keen and hard with plates of gold in his hand; they all came to him to show him their stabs and their sores, and he gave each one a cure, and what at last happened to each was even the ill he foretold him.' 'He is the power of leechcraft; he is the healing of wounds; the thwarting of death; he is the absence of every weakness, is that man,' said Fergus, 'namely Fingin, the prophet-mediciner, the physician of Conchobar, with the leeches of Ulster around him . . . Their medicine bags are the sacks which thou sawest with them' " (Dunn, 1914).

The word mediciner in the middle ages meant professor (Underwood, 1977), and this suggests that the Broin Bhearg was a medical school at which the physicians had their training.

There is very little need for comment on that except to compare and contrast Fingin and his band of physicians with Machaon and Podaleirius of the Achaeon forces in the Iliad who were primarily warriors and secondarily surgeons. Fingin and his troop were primarily healers and the short sword was a weapon of self-defence, not offence.

The final battle was a success for the men of Ulster. They won the battle but really had lost the war because of the loss of their wealth of cattle, women and children. The final incident in the story is worthy of close examination.

HYDRAMNIOS

The army was fleeing towards the River Shannon at Athlone: "Medb had set up a shelter of shields to guard the men of Ireland . . .

"Then Medb got her gush of blood.

" 'Fergus,' she said, take over the shelter of shields at the rear of the men of Ireland until I relieve myself.'

" 'By God,' Fergus said, you have picked a bad time for this.'

" 'I can't help it,' Medb said. 'I'll die if I cannot do it.'

"So Fergus took over the shelter of shields at the rear of the men of Ireland and Medb relieved herself. It dug three great channels, each big enough to take a household. The place is called Fual Medba, Medb's Foul Place": literally 'Medb's urine'.

The four facts we get from the story are that in her hour of need Medb turned for help to Fergus, not to her husband. She passed a huge volume of fluid which was thought to be urine. She was in severe pain before she passed it and the onset was heralded by a gush of blood. When taken with her adultery with Fergus a few months earlier, this, I suggest, adds up to a classic case of acute hydramnios, which can be very acute and extremely painful. It is frequently associated with congenital malformation (Macafee, 1950), and such malformations are more common with elderly parents such as Medb and Fergus were. The volume of fluid may be as great as six gallons (27 litres) (Brews, 1963), and if this were thought to be urine, then no wonder that the amount became exaggerated over the years until it was large enough to gouge out the foundations for three houses! Even that, on closer examination, is not so remarkable as it first appears, because the only foundations for many Celtic houses were very shallow trenches in which was placed a plank of wood, through holes in which upright stakes were placed.

POSTSCRIPT

That marks the end of the Táin but not the end of the story. Violence breeds violence, then as now. Medb was killed by her nephew Furbaide to avenge his mother's death and is buried at Knocknarea in County Sligo. Cuchulainn's turn came too, when the relatives of those whom he had killed in single combat joined together and slaughtered him. A statue of the 'Dying Cuchulain' is in the General Post Office in Dublin, while we in Ulster hardly know his name. The death of Cuchulainn has inspired many artists and poets, the most recent being Dr. Ian Adamson, a Fellow of this Society, who for this occasion has written:

THE DEATH CALL OF CUCHULAINN
CHAMPION OF ULSTER

1. We have slain him, but we fear him
   As we stand in silence now,
   For the Hero-Light still lingers
   Like a lantern on his brow;
   And the wiles of witchcraft jeer him
   With the phantoms of our dead
   As they moil like May Mosquitoes
   Round his torn and bleeding head.

2. Now the host of Ireland shivers
   In a swift encircling gloom,
   For the Noon-Day Sun is sharing
   All the anguish of his Doom;

And the Shield of Conor quivers
As the Waves of Rury sound,
Easing all the pains of childbirth
From the Curse of Macha's Mound.

3. "Oh my Father! I am dying
As the Wise Men have foreseen
And the Red Branch rise in vengeance,
Stirred by Conall's aweful mein.
Oh my Father, hear my crying!
With the parting of this day
Let the fairest Dreams of Fola
From this Island fade away."

4. Thus he speaks; the Queen of Connacht
Screams and spits with maddened glee,
And around him, drunk and dank,
Obscenely dance the Sisters Three.
But we know that we have won naught,
For our Great Spears will not rise
Till the mighty Hound of Cullen
Wakes at last in Paradise.

S. I. G. ADAMSON

The poem refers to many events in Celtic mythology which are not part of the Táin, but some readers may be stimulated by it to delve deeper into our cultural heritage.

MODERN PARALLELS

Cuchulainn's death was avenged by Conall Cernach, and so it went on, and so it still goes on:

"Each killing only asks for more,
For some to kill is just a chore:
Slaughter is rife" (Gallagher, 1977).

The Ulster of Conchobar, Derdriu and Cuchulainn was the land of both Ulad and Pict or Celt and Cruthin, but both were united against a common enemy. It was easy for them to unite to repel an invader, but, so far, we have been unable to overcome our traditional, cultural and religious differences to unite to conquer the enemy within the gates. Our common enemy—in fact, the enemy of all civilisation—is violence and the lethargy which prevents us taking adequate action is every bit as effective as 'the pangs' which afflicted the Warriors of the Red Branch.

Last winter two women, by their courage and charisma, brought thousands of Ulster men and women to their feet to demonstrate their hatred of violence. They even mounted an invasion of the South by combined Cruthin and Ulad, or

Catholic and Protestant, or Republican and Unionist, and once more the forces of Ulster confronted the Rest of Ireland in the valley of the Boyne.

Whatever we think of events since then, we must admit that these two Nobel Peace Prize winners achieved something which no one else had thought of attempting and it may be that, in spite of present evidence to the contrary, historians in the future will look back at that confrontation and mingling in peace on the Boyne Bridge in Drogheda as the turning-point in our struggle.

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IRISH SURGEONS AND AUSTRALIAN HISTORY

by

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DIXON LECTURE 1977

IRISH blood, flowing in the veins of the Australian nation, makes it different from other races of the old Empire. Much of the Irish heritage of courage, warmth, good humour, love of song and poetry, and argument, and Irish hospitality, permeates our national character. It has seemed to me that we do not appreciate each other as close relatives and members of a family as we should, and that we miss much by not doing so. Our peoples share the same blood, the same language and much of the same history. We should seek and nurture intimate ties of friendship. The world is no longer separated by an insuperable barrier of distance. We should build human bridges across the seas between our countries so that we may know each other as friends and neighbours.

Australia was founded as a convict colony during a period of political turmoil in France and in Ireland. Its early existence was threatened by a war between England and France which began in 1793 and lasted until the allied victory of Waterloo in 1815. Many Irish men and women, some patriots rebelling against a conqueror's tyranny, some wicked and brutal outlaws beyond redemption, some poor people, victims of desperate poverty, and others needing a new beginning, were transported together holus-bolus indiscriminately to Botany Bay. At first they went by the writ of the Irish Government and then, following the Act of Union in 1801, they came on that of the British Parliament. Transportation of convicts to Australia continued until this evil thing was abolished in 1840. About one-third of all prisoners in the colony were Irish and bitterly hostile to the country and governing classes this represented.

The penal period of Australian history was marked by constant strife, and in some cases by bitter hatreds between rival interests. These were the convicts and the emancipated prisoners striving for their rights and their freedoms, the free settlers and the self-conceived moneyed aristocracy wanting land and freedom also, and the Governor and his military autocracy, the all-powerful representative of the British Government. He controlled the land and its people until the evil of transportation was abolished and government by an elected assembly, and trial by jury, were attained. Autocratic power resisted the idea of a free colony. Local government and trial by jury were granted by Irish-born Governor Richard Bourke of Limerick, a sincere reformer with a broad understanding of the new nation's needs similar to that of its earlier enlightened governors, Macquarie and Phillip.

Until 1840, when a government provision of assisted passages to aid in immigration of new settlers was made, Australia had been too far away from the Irish homeland, the cost of emigration there too much, and life in the new land too grim and too lonely to attract many Irish settlers. In addition, it was under British rule and so tainted to many Irishmen by associations which repelled them. Departure across the world to the Antipodes constituted perpetual exile from the

Ireland and the land and the life they loved so passionately. The great mass of people with a taste for a new freedom migrating from economic and social bondage in Ireland found this in the newly independent American colonies, so close at hand across the Atlantic. This flow became a mass migration in the years of famine and many of the people carried with them across the sea a racial memory of oppression and unkindness.

Just as the Irish regiments, fighting courageously on the battlefields of Europe and India, helped to found the British Empire, so Irishmen, including naval surgeons, played an honourable part in promoting the health and welfare of Britain's newest colony in Botany Bay. Peacefully established as a penal colony, resisted only by its aboriginal inhabitants and growing in misery and pain, this would one day become the Australian nation. The migration of free settlers who arrived to occupy the newly discovered fertile lands in Australia and its new settlements became massive in the 1850s, following the discovery of a mint of gold in Victoria and in New South Wales. This included a wave of free Irish settlers. They came in search of land and fortune in the fast clipper ships. Many became leaders in government, business and the professions. Their descendants intermarried with the Scots and English and became Australians, a friendly, assertive, emotional and independent race who add their own Anglo-Celtic flavour to a European civilisation in the Pacific. I will select some colourful Irish surgeons from several periods and show the parts they played in the contemporary scene.

THE FOUNDATION AND EARLY SETTLEMENT OF THE COLONY

In 1786 John White (1759-1832) was, at the young age of 27, appointed Surgeon-General for the convict transportation fleet about to sail for Botany Bay and found a nation. He was born in Drumaran, County Fermanagh, joined the Royal Navy as a surgeon's mate, received his diploma from the Company of Surgeons in 1781, and served conscientiously as a naval surgeon in India and the West Indies. Largely as a result of his foresight, organisation and good medical care, and his insistence on clean clothing, hygiene and fresh food, the voyage across the world to Botany Bay, transporting 1,500 people and taking eight months, was accomplished with only four deaths, and the colony kept without serious illness for the first critical two and a half years afterwards.

White was interested in natural science and he accompanied Governor Phillip on two journeys of exploration. He recorded his experiences and observations in a book, published in 1790: "Journal of a Voyage to New South Wales"—with 65 plates of animals, birds, lizards and curious cones of trees and other natural phenomena which he had drawn himself. He sent the first live kangaroo back to England. Two years later he wrote about the settlement in a state of disenchantment as a country so forbidding and hateful as to merit curses and execration, a place of misfortune for them all. He concluded this letter with a remark that subsequent time and discovery have made complacent and shallow, which I quote: "There is no single article in the whole country that is of the slightest use to the mother country or to the commercial world."

White fought Australia's first duel with his fellow surgeon, William Balmain. No hurt was done, but an enduring enmity remained. He returned to England in 1794, never to return. His natural son, Andrew, born of a convict mistress, fought as an officer at the Battle of Waterloo in 1815.

Irish born, Dennis Considen (1815), an earnest and humane naval surgeon, anxious to do well in his profession, sailed as a surgeon's mate in the first fleet aboard *H.M.S. Scarborough,* and during his time in the settlement he studied Australian natural history. He employed indigenous plant extracts medicinally to alleviate scurvy, dysentery and other diseases which later scourged the settlement. He tried out sarsaparilla, native celery, preparations of yellow gum from the grass tree, the red gum, and peppermint and eucalyptus oil from various eucalyptus trees. He wrote to Sir Joseph Banks in 1798, and I quote: "If there is merit in applying these and other simples to the poor wretches, I certainly claim to have been the first to recommend them." His claim to priority is disputed and he makes no mention of aboriginal medicinal lore. He returned to Cork in 1794 and later went to Edinburgh, where he qualified as a doctor of medicine in 1804, referring in his thesis to his discovery of eucalyptus oil.

The third naval surgeon of the beginning period was D'arcy Wentworth, the impecunious son of a Portadown innkeeper and descended from English Whig aristocrats, the Earls of Strafford. He began his career apprenticed to Dr. Patton of Tandragee but, lured by the promise of an appointment to the East India Company, he set off for London and qualified as a surgeon's mate in 1785. His career almost ended in disaster in 1789 when he fell into debt. Seeking to retrieve his fortunes by highway robbery, he was arrested and charged at the Old Bailey. He escaped justice (it is held) by voluntarily taking passage to Botany Bay as an assistant Royal Naval surgeon and serving in the convict establishment on his arrival. He justified the pardoning of his youthful indiscretions, for during the thirty-seven years of his life in New South Wales he contributed much to the life of the colony as a surgeon and later principal medical officer and as the chief police magistrate. He became a wealthy landowner and was free of the belligerency of his associates, but unswerving in his support of emancipation and trial by jury in the colony. His partners and he built the first Sydney hospital in exchange for a concession allowing them to import spirits duty-free into the colony, and this institution, The Sydney Hospital, was known as the "Rum Hospital" for this reason. Although he showed no particular distinction as a surgeon, his contemporaries considered him a lover of freedom, a consistent friend of the people and an honest man. His son, William Wentworth, qualified as a barrister at the Inns of Court, took silk and subsequently led the Australians in their struggle for emancipation from autocratic rule and for trial by jury.

THE SECOND WAVE

These arrived as free settlers to the newly discovered fertile lands and later in the wake of the gold rush. William Crooke arrived in Tasmania in 1841 and was appointed Resident Surgeon of the Hobart Hospital. He was the descendant of Sir Thomas Crooke, the founder of Baltimore in Ireland, from which the American

city took its name, and MacCarthy More, Prince of Munster. He took up private practice and, becoming a member of the Tasmanian Legislature, advocated protective tariffs to foster local industry. He emigrated to Melbourne in 1857 and was the first to report smallpox in Victoria.

Sir Thomas Naghten Fitzgerald, early Melbourne's most distinguished, popular and respected surgeon, qualified in Dublin in 1850 at the age of 20 and immediately took passage to Melbourne, where he was appointed to the staff of Melbourne Hospital at the age of 21. He remained on the staff for 40 years. He was especially interested in orthopaedics and in deformities. He successfully practised subcutaneous tenotomy for talipes and for a variety of other deformities. He adopted Lister's antiseptic method in 1868. The discovery was brought to Melbourne by Dr. H. M. Night March, Lister's house surgeon, then taking passage in a clipper ship. He was a great teacher, an excellent operator and a popular and much-loved figure in Melbourne. He was always received with an ovation at the Melbourne races as he drove on to the course in his open coach, drawn by splendid horses. He went to the South African War, appointed as surgical consultant to the Australian Expeditionary Forces, and he reported favourably on the morale, the medical services and the treatment of wounds. When he died he was mourned as Melbourne's greatest surgeon.

Dr. Robert Charles Alexander Lindsay was born in County Tyrone of a pioneer family of linen and yarn merchants. He qualified at Queen's College, Belfast, and emigrated to Australia, taking passage on the *Red Rose* for Melbourne in 1864, and on arrival immediately went to the goldfields in Victoria. He founded (according to Sir Robert Menzies) Australia's most illustrious family, for of his ten children five became famous artists.

Charles MacCarthy, a lovable, slightly fey, adventurous and generous Irish character, emigrated to Sydney from Dublin because he thought the warm sunshine might be good for his chest. He joined the surgical staff of St Vincent's Hospital in 1876. As a student he had served in a French ambulance during the Franco-Prussian War and had been awarded the Croix Militaire after the Battle of Sedan. He was a tiny, dapper, bearded Irishman who spoke with a melodious Tipperary voice. Apart from his surgery, he was a sculptor, an artist and a musician. He did busts of John Dillon and Sarah Bernhardt which were exhibited at the Chicago Fair in 1893 together with a portrait of Sarah. A beautiful bronze of Mary Aikenhead, the founder of the Irish Sisters of Charity, adorns the grand staircase of St Vincent's Hospital in Sydney.

Lister's antiseptic method had not entered his imagination. In the operating theatre he would habitually turn up his sleeves and operate with his bare hands and with his rings on his fingers. Sometimes, during an operation, he would pause, call for a pen, take it and write for a moment or two on to his cuff. As he resumed operating he would say: "A beautiful melody has just passed through my head." During the First World War he wrote patriotic songs, including "The toast is Anzac".

Refrigeration with ice as a means of local anaesthesia had just been reported in the medical journals. MacCarthy used this method on a patient with haemor-

rhoids. When he removed the ice and applied a clamp to the protruding piles, his patient leaped from the table with an anguished howl and stumbled painfully to the door, with MacCarthy hanging on to the instrument and pleading with him in an anguished brogue: "Stay, friend, stay." He was a lovable character.

Warm-hearted Irish nursing sisters mellowed and refreshed the hard life and still harsher fate of many early Australians. Our nation has received no greater gift from Ireland. In 1815 Mary Aikenhead, anxious to emulate the gentleness and kindly simplicity of the ancient hospital de la Pitié in Paris, an institution and a Christian society which was to influence Florence Nightingale and inspire her with a model from which she created the British and Australian nursing services as a skilled calling, suitable for gentlewomen, founded the religious order of the Irish Sisters of Charity. They opened St Vincent's Hospital in Dublin in 1834. Miss Alicia de Lacy of Limerick joined the Sisters in Dublin as Sister Baptist and learned the ways of Christian nursing. She was chosen in 1834 to be one of five Sisters to leave her homeland and serve in the grim penal colony of far-off New South Wales. She was destined to found Sydney's St Vincent's Hospital in 1858, where her warm and generous heart embraced and cherished all in need—Catholic, Protestant and Jew alike. In the course of time, and when many storms had passed, in 1920, the Sisters were directed by Irish-born Mother Superior Mary Daly, who was described by Herbert (Paddy) Moran, the surgeon, as his ideal of a great and remarkable woman, and I quote: "She possessed a sparkling Celtic humour, but her Celtic temperament could crystallise at will into determined action. She inspired all about her with the fire of enthusiasm. Her life was studded with the gems of charity, and those whom she befriended never forgot her. She mothered St Vincent's in Melbourne to grow into a famous hospital and she moulded the great destiny of St Vincent's in Sydney. She was a frail woman but so busy living for God that she had no time to think of dying. Her value was that of jewels brought from afar, even from the remotest lands."

SURGEON SONS OF THE PIONEERS

Henry O'Hara (died 1921) was a notable flamboyant surgeon and teacher among the eminent surgeons of Victoria. He was born in Cork, emigrated to Australia as a boy and returned to Ireland to study medicine. Here he passed his FRCS in 1878, partly supporting himself in the meanwhile as a professional singer. He returned to Melbourne afterwards. He had the reputation of being a fast and skilful operator. It is recorded that in three hours he performed two radical operations for hernia, one strangulated hernia, a cholecystectomy for gall-stones, a pan-hysterectomy, removed a hydatid cyst from the wall of the colon and did two appendicectomies. He then repaired to the medical officers' room for a 'spot', where he kept his entourage in fits of laughter with a fund of stories.

Like a true Irishman, he always had a feud on his hands. He was the bane of the lawyers. It was said that Melbourne railways paid him a 'retaining fee' not to speak against them in law suits. He was a bold and resourceful surgeon and at his best with a gallery of his cronies and admirers. He was a champion sportsman, excelled at golf, and when his horse, Ben Bolt, won the Melbourne

Cup, it was agreed that there was nobody sober in Melbourne's Brighton that night. His teaching of medical students was full of riotous humour.

He became clean-shaven and proclaimed that all surgeons should be clean-shaven. One day he said: "I witnessed a painful sight the other day. A leading Melbourne gynaecologist became confused and during an operation finished the perineal toilet with his beard." It was the jolly, robust and uncomplicated society of the goldfields. He charged high fees. On one occasion, when asked by the leading barrister of the day, a man called Purves, whether 500 guineas was the largest fee he had charged, he replied that he had once charged a patient 1,000 guineas. "Indeed, sir," said the lawyer, with a sly glance at the judge, "was it for a legal or an illegal operation?" The next day, meeting Purves in Collins Street, he knocked him down, thrashed him and arrived at the outpatients with his eyes aglow. The incident made headlines in the press. There is no doubt that Henry Michael O'Hara was the dominant medical figure of his day in Melbourne.

Charles "Plevna" Ryan was the son of an Irish overlander from New South Wales who had married the daughter of a famous artist and ornithologist. He was a man with a buoyant and genial personality, a romantic hero who lived life to the full, universally loved and respected during his lifetime. He was educated in Melbourne, spent two years at Melbourne University and subsequently graduated in medicine at Edinburgh University in 1875. While doing post-graduate studies in Vienna, he saw an advertisement calling for the enlistment of military surgeons by the Turkish Government. He applied for a commission. In 1877 he was one of the few surgeons who survived the sieges of Plevna and Erzeroum, with their horrors rivalling those of the Crimea. In 1878 he returned to practise in Melbourne. At his first operating session, after appointment to the staff of the Melbourne Hospital, he was startled to find the whole staff assembled to witness his skill, for he was the hero of Plevna.

He was a great teacher and a courageous surgeon. He had a generous chivalry and courtesy about him, and a genius for friendship that endeared him to all. He came into a sickroom like a clear sunbeam. Nothing would induce him to drive his new De Dion-Bouton motor-car, one of Melbourne's first motor vehicles, claiming that this would affect the steadiness of his hand. His coachman reluctantly became his chauffeur. Ryan had a high sense of duty. At 61 he insisted upon going to the First World War with the Australian Expeditionary Force. He became Assistant Director of Medical Services on General Birdwood's staff at Gallipoli. During an armistice arranged between the fighting forces to bury the numerous dead, the Turkish officer in charge noticed that he was wearing his Turkish decorations and embraced him. Ryan was overcome with emotion. Later in the war he was appointed Consulting Surgeon to the Australian Forces in London. He became the most decorated member of the Melbourne Hospital staff as KBE, CB, CMG. He worked hard and lived and enjoyed life to the full.

Herbert "Paddy" Moran, who was born of Irish parents, graduated in medicine at Sydney University in 1908. He captained an international rugby team soon afterwards and stayed in Ireland to work in the Rotunda Hospital for a time. He served in the Royal Army Medical Corps in both World Wars. After demobilisa-

tion in 1918, being inspired by the concept of applying radium as an ancillary to surgery for treating cancer, he studied at the French Radium Institute. On his return to Sydney, he was the pioneer user of radium in cancer and active in Australian and New Zealand cancer research and organisation. He encouraged medical graduates to travel and study at universities abroad and to contribute to medicine and literature. His life was punctuated by warm friendships which were easily broken. In 1923 he left Australia for ever at the height of his career to live in Italy. Among his non-medical writings, the most well-known and controversial was "Viewless Winds". Seldom has any Australian combined the enthusiasm and idealism of a medical pioneer with literary achievements and knowledge of four languages and their literature. He is commemorated by a memorial lecture on medical history from the University of Sydney and the Royal Australasian College of Surgeons which I had the honour to deliver this year at the jubilee of the College of Surgeons on the subject of "The Saga of Cardio-Thoracic Surgery in Australia over 200 years".

CONTEMPORARY SURGEONS OF IRISH EXTRACTION

These are closely knit within the fabric of the Royal Australasian College of Surgeons and the colourful tapestry includes many surgeons and physicians, even myself. Among these I might mention Sir John Eccles, Nobel Prize-winning physiologist who did much to unravel the mystery of the nervous system; Sir Patrick Kenny of St Vincent's Hospital, Sydney, Past President of the Royal Australasian College of Surgeons and President of the Medical Board of New South Wales; and the three Windsor brothers, sons of the late Henry Morgan Windsor of County Tyrone. Windsor came to Australia in 1914 to pursue a long, useful and tranquil life in Brisbane and raise a family of distinguished surgeons. He was made an honorary fellow of both the Royal College of Surgeons of England and of Australasia. In 1976 he died at the age of 92, still in practice and driving his own motor-car at the time of his death.

Drs. Alan Dwyer, Justin Fleming and Noel Newton, beloved and distinguished Sydney surgeons, all of whom died recently within a year of each other, have been jointly commemorated by the fellows who loved them and the work they inspired.

At the recent jubilee meeting of the Royal Australasian College of Surgeons there were notable contributions by men of Irish blood, especially in the adventurous fields of cardiac and microsurgery. Just across the Tasman Sea, Pat Molloy heads cardiac surgery in the Scots stronghold of Dunedin. He arrived in Britain with my blessing, a family of daughters, a heart bursting with enthusiasm and listening to the siren song of surgery. With Irish doggedness, however, he sired nine daughters before being granted an Irish son who may be a surgeon in the making.

CONCLUSION

Irishmen, by encouraging free debate and with their humour, have helped to nourish Australian surgery, free from the shackles of authority and dogma. In our multi-racial society there is peace, mutual respect and friendship between

most Celts and Saxons, and between Protestants and Catholics. We are one family. There is an acknowledgment of common interests, an exchange of friendship and a mutual understanding. Whilst there are differences of race and religion, these are accepted and serve to vitalise and flavour our personal relationships. The old faith and national character of Ireland clearly add interest and a fine Celtic flavour to young Australia. We owe much to the Anglo-Irish stock from which we sprang.

INDUSTRIAL DERMATITIS AND THE LAW IN NORTHERN IRELAND

by

J. MARTIN BEARE, MD, FRCP

ANNUAL ORATION AT THE OPENING OF THE 1977-78 TEACHING SESSION, ROYAL VICTORIA HOSPITAL

IT will be my purpose this morning to review the mechanisms for compensation for industrial injuries available in Northern Ireland. I had not been working at this lecture for very long before I realised how little I knew about the legal aspects of the subject. This is in spite of almost thirty years of medical work for the courts. For obvious reasons, most of my remarks will refer to industrial dermatitis, a major problem all over the world. For example, in the United States of America, skin disease is industry's No. 1 health hazard. According to the United States Public Health Service, two-thirds of all occupational diseases are diseases of the skin. One out of every four workers is exposed daily to potential skin irritants. For example, 55 per cent of industrial plants use plastics and synthetic resins, 82 per cent handle epoxy resins, 77 per cent use solvents and lubricants, 75 per cent expose workers to acids and alkalis, and 58 per cent handle cutting and coolant oils, all potential causes of dermatitis. Recently the Department of Health and Social Security in this country estimated that in 1971 there were *seven million* working days lost because of dermatitis.

When a workman receives an injury, and industrial dermatitis falls within this definition, he will probably do one of three things, or all three. He will see his factory doctor, or family doctor, or he will consult his shop steward.

If he sees his own or family doctor, a diagnosis of industrial or non-industrial skin disease will be made, and the workman may or may not be told to go off work or perhaps will have his job changed. In most cases this will probably depend on the severity of the rash. In my opinion, if the doctor is wise, he will also refer the patient to a dermatology clinic for investigation and patch testing. If he asks for help from his Trade Union, and he is fully entitled to do this at an early stage, he will be referred to the factory doctor and probably to his solicitor or to a Trade Union solicitor who will, in turn, require a medical report stating that the worker has industrial dermatitis. This will come from the factory doctor or from a dermatologist who specialises in medico-legal work. If the firm has a factory doctor, he will probably send the worker to a consultant dermatologist for advice. It can be seen that, in most instances, the patient will eventually end up at a dermatology clinic in the hospital under the National Health Service or be seen privately outside the National Health Service.

If the patient is put off work by the factory doctor, he will be entitled to claim industrial injury benefit from the State. The mechanism by which this is done is that the worker requires a certificate or statement from the general practitioner and, on completion, he forwards this to the Central Benefits Branch at Stormont. If the patients is still off work after six months, he normally goes on to sickness

benefit and then invalidity benefit, but he can also claim disablement benefit. If this is awarded, it will be X per cent for life, depending on the degree of disablement decided by the Board. This percentage varies from 100 per cent, for example, if he is totally disabled, to, say, 10 per cent if he has been sensitised to a particular chemical and must avoid working with this chemical for the rest of his life. If the percentage is less than 20 per cent, he will be offered a lump sum. The amount of money offered is tied to the cost of living and so varies from month to month. Special hardship allowance can be paid if, as a result of the industrial disease or injury, the patient is unable to follow his regular occupation or do work of an equivalent standard.

When the patient has had an accident at work, which may qualify for injury benefit, sickness benefit is normally paid until the necessary inquiries have been made by the authorities in order to satisfy themselves that the necessary conditions have been fulfilled. This involves sending the employer a questionnaire in which is filled the details of the Factory Accident Report Book. It may also involve a visit to the factory by a member of the staff of the Department of Health and Social Services. Once the Insurance Officer is satisfied that the claimant is entitled to injury benefit, this is then paid and is continued for 26 weeks from the date of the accident or for a shorter period if the claimant becomes fit for work within the 26 week period. Disablement benefit may then be payable. When a person claims that he has an industrial disease, he will be examined by doctors employed by the Department of Health and Social Services to assist the Insurance Office to determine whether or not he is entitled to benefit. If the examining doctor is unable to arrive at a diagnosis, the patient may be referred to a dermatologist for his opinion.

Now let us take the other side of the story. The workman may believe that the reason he developed dermatitis was not his fault but the fault of his employer. Here he will be advised by his solicitor, who in turn may require the help of a report from a dermatologist. To this end, the employee may be entitled to medico-legal aid to cover the expenses of his solicitor and the medical report. In many cases the solicitor will now, without further ado, make a claim against the employer, who will in turn pass this over to the insurance company. They will send one of their inspectors to the factory to take details of the work conditions, and they may well decide to settle the claim after discussion with the plaintiff's solicitor and avoid further expense. In any event, it is likely that the insurance company or the solicitor will want a medico-legal report before negotiating. If the case is not settled at this early stage then, if the plaintiff's solicitor considers that the case is not worth more than £1,000, he will apply for the case to be heard at the County Court. If the case is thought to be worth more than £1,000, he will apply for it to be heard at the High Court. In this event the worker's solicitor will make application to the court for damages and for this purpose he will require the help of a barrister. A statement of claim setting out the details of the employer's alleged negligence, the worker's injuries received and his loss of earnings is set out.

Daily, in this and other hospitals in the province, you will find consultants leaving their work in the outpatient clinics at 10.00 to 10.30 in the morning and you may wonder where they are going. If you ask, you will be told: "He has got

to go to court" and the operative words here are "got to", because, if requested to go to court, as far as I know, there are only three acceptable excuses for not going. Firstly, illness—and a doctor's certificate has to be produced; secondly, leave or holidays abroad (it is no good having leave or holidays at home); thirdly, the death of a near relative—I once found, to my surprise, that the funeral of an uncle, and I was his nearest relative, was not an acceptable excuse.

It is not good enough to plead that the outpatient clinic is fully booked and patients have to be seen or an operating list has to be completed and adequate help is not available. A colleague of mine was once given 12 hours' notice to attend court. He was single-handed and had booked 30 patients for his clinic in the morning. There was no way of stopping the patients coming and they all turned up to find that he was not there. The reason given for this system is that so many other people have to attend and have made arrangements and the consultant is invariably an essential witness. There may be three to twelve or more witnesses, two solicitors with clerks, four barristers, a judge and, in Northern Ireland, a jury all called at the same time. If the consultant does not appear, the hearing has to be postponed. I have heard it argued by a lawyer whom I regard with great respect and affection that the system in Northern Ireland for dealing with civil actions is the best in the world. I respect his opinion, but we in this province are the only people who have a system which requires doctors to attend court so often. You may well argue that consultants could easily opt out of medico-legal work, but many of these plaintiffs are seen as patients in the routine work of our hospital and we are perfectly entitled to see them under the terms of our contract, whether this be part-time or full-time.

It is one of the paradoxes of dermatitis that, although everyone loses because of it, it is quite popular among workers. The compensation possibilities are so well known that a victim's face tends to light up at the diagnosis. He sees the prospect of cash flowing into his coffers, and ignores or forgets or simply does not know that even a fairly generous award will not keep him in champagne for the next forty years if dermatitis prevents him from working again. The record settlement, as far as dermatitis cases are concerned, is, at the moment, as far as I know, £14,500, which has been given on two occasions. The amount awarded by the court depends on: the amount of money lost in wages to date; the money likely to be lost in the future, for example, if the worker is unable to continue his job or unable to get any employment; pain, suffering and social inconvenience. For example, if the worker happens to be a golfer and finds that he cannot play golf because of the condition of his hands, then this will increase his award. In fact, of the majority of industrial dermatitis victims, nearly 60 per cent suffer financially as well as physically as a result of the disease, in spite of compensation. The worker who grins all over his face when dermatitis is diagnosed is certainly being a bit dense. It may win him a bit of cash in the short term but is likely to be a discomfort and a disability to him for a long time, perhaps for the rest of his life.

In Canada an employee cannot sue his employer for compensation. Instead, the facts of the case are put before a tribunal representing all interests in industry, which determines any financial loss which will be incurred by the victim and, if

possible, locates him in an alternative job. The emphasis is less on hand-outs than on rehabilitation. If the tribunal finds that an employer was negligent, it may take corporate action against him.

The Confederation of British Industry (CBI) have recommended that a 'no-fault' system of compensation should be implemented on condition that the cost to industry is no greater than at present. This would automatically compensate workers rather than their having to fight for money in the courts. The CBI's proposal of a 'no-fault' system should reduce the administrative costs of the present system, allowing more money to be paid out in compensation. In 1971 approximately £50 million was paid out in claims, while legal and other running costs of the actions amounted to more than £15 million. The industrial injuries scheme paid out benefits worth something like £130 million in 1971 at an administrative cost of £13 million.

The common law right of action for damages in court entitles an injured person to obtain damages if he can prove that the injury was caused by the negligence and/or breach of statutory duty of his employer. Since all employers (with special exceptions) are now required by law to insure against this liability, an action is in practice normally defended by an insurance company, and in civil cases "the balance of probabilities" is enough for the plaintiff to win; whereas in criminal cases "proof beyond reasonable doubt" is required. If the employer asks his workers to handle or be in contact with irritating chemicals or sensitisers likely to cause dermatitis, he is bound by statutory duty to supply gloves, aprons, etc., and to make available good washing facilities with hot and cold water, soap and towels. He must also warn his workers of any risks involved in handling these chemicals and the importance of taking precautions. This warning must be verbal and in writing. If he does not take these precautions he is guilty of negligence. If the worker, having being warned, fails to utilise the preventative measures available (perhaps he may be on bonus work and finds that gloves slow down his rate of production and therefore his earnings), then he may be found guilty of contributory negligence.

It has been estimated that about four in seven employees injured at work pursue a common law claim. Of those who do, the vast majority, probably more than 90 per cent, settle out of court. The level of settlement in these cases is usually lower than it would be in a successful action in court. The situation in Northern Ireland is actually more open to criticism than that in the rest of the United Kingdom. Here a victim is entitled to ask for a jury trial, whereas in Britain all compensation claims are heard by a judge sitting alone. Juries are inclined to favour the claimant because he is an individual like them, and they don't want him to go short, and so awards tend to spiral. Nor is any guidance as to the suitability of an amount offered to a jury. The authorities might look at the anomaly whereby seven-man juries are required in civil cases in Northern Ireland, while in Britain they are decided by a judge alone. Lay men and women are simply not qualified to assess compensation and, by changing the system, many wasted man-hours could be saved.

The abolition of the rule which limited jury service to property-owners was long overdue. Recently, jury lists became open to all between the ages of 18 and 65. The effect was to spread the burden of jury service much more equitably than before and, hopefully, to make everyone more aware of his or her civic responsibilities. In the past, the jury lists have been chosen from a mere 60,000 citizens, with valuations from £32 in towns in £26 in rural areas, and their names could be drawn out of the hat at intervals of two to three years. Obviously more men than women were called. The only qualification necessary to be a juror is that you should know absolutely nothing about the law and, probably, never to have done the job before. It has been said that the average juror is middle-aged, middle-class and middle-minded.

People exempt from jury service include Members of Parliament, the Armed Forces, persons concerned with the administration of justice, public officials such as heads of departments, officers in the Post Office and Customs and Excise. Others precluded from service are clergymen, members of Holy Orders, stafis in schools and universities, masters of vessels, duly licensed pilots, lighthouse keepers, doctors, dentists, nurses, midwives, veterinary surgeons, pharmaceutical chemists and incapable people. Persons who have been sentenced to life imprisonment or for a term of five years or more, as well as anyone who has served a prison sentence within ten years of being called, are disqualified. Others disqualified are persons who are deaf or blind or who cannot read or write the English language, or suffer from lunacy or imbecility of mind.

When the first case is called the clerk of the court ballots for the seven members of the jury. He picks names out of a box at random. Both the defendant and the plaintiff can each each challenge six names without giving any reason. After that they can challenge as many as they like but they must state their objections. When the jury box is full the first person to be called is designated as foreman. Each person is sworn individually. Normally he takes a copy of the New Testament in his right hand and repeats the oath: "I swear by Almighty God that I shall well and truly try the issues which are joined between the parties and a true verdict give according to the evidence." There are, of course, other methods of taking the oath. For example, Chinese jurors are handed a saucer; they kneel down and break it in pieces and then swear: "I tell the truth, the whole truth. If not, as this saucer is broken, may my soul be broken like it."

Approximately 6,000 people this year in the province will be called upon to serve on juries. They refuse "at their peril". Of the total a shade over half will actually be sworn on to juries to try cases. The remainder will have wasted day after day in irksome idleness waiting for the judicial process to use them or let them go back to their occupations. Everyone admits that the system is wasteful. It is not unknown for a juror to spend a week or more at court being "stood by" in every case. Another frustration is being sworn on to a jury in a civil action and then dismissed because the parties have reached agreement. To quote an ex-juror: "It is the most tiresome experience you can have. Think of all those people, most of them losing part of their income, hanging around the court for a princely £1.00 per day. Surely there must be a better system."

It is of interest to compare the amount of court work which we as consultants do in Northern Ireland with that done by our English and Scottish colleagues. Recently I wrote to eight colleagues in dermatology of the same age and seniority as myself, working in various industrial cities in England and Scotland, where they don't have a jury system, and asked them three questions:

1. How many times have you been called to a consultation in court in the past five years? Together the eight said 22 times. My comparable figure was 260.
2. How many times have you been called to a High Court with a view to giving evidence only to find that the case is settled before the case proceeds? Here the highest was five, the next three and one not at all. My comparable figure was 115.
3. How many times have you given evidence from the witness box in the past five years? Together the eight said 26 times, an average of just over three. My comparable figure was 14.

On 8th October 1971 representatives of the British Medical Association, the General Council of the Bar of Northern Ireland, the Incorporated Law Society of Northern Ireland, the Supreme Court of Northern Ireland and the Northern Ireland Hospitals Authority met to consider court work in this province. A plea was made for the free exchange of case notes to medical witnesses of both parties. Particular emphasis was made on the radiation hazards to patients resulting in repeated and unnecessary x-rays due to the non-availability of x-ray plates in the possession of the other party. Reference was also made to the hazards of dermatological patch testing and repeated patch testing. The British Medical Association recognised the need for the desirability of consultations prior to a case being heard. They said that medical witnesses were usually called for consultation at 10 o'clock in the morning and this led to a loss of consultant time in hospitals. Such consultations may last only 10 minutes or less, and the services of the consultant in court may not be required before 11.30 a.m. or later. To quote again from the minutes of this committee: "While the representatives of the legal profession wished to be as helpful as possible, it was pointed out that little real progress could be expected while the present jury system remains. Experience has shown that, in the interests of a plaintiff's case, a verbal medical report is preferable to a written statement agreed by both parties."

In December 1974 the orthopaedic surgeons of this province wrote to the Right Hon. Sir Robert Lowry, Lord Chief Justice, expressing concern at the amount of time consultants spent in court. To quote: "We are seriously disturbed by the amount of time many of us are presently obliged to spend in court. This is time which should unquestionably be spent in the performance of our proper duties. In the nature of things the periods of time involved are irregular, inconstant and unpredictable. When summoned to be present at court, one can never be sure in advance whether one's presence will be required for part of th morning, the whole morning or even most of the day; or whether, indeed, one will be told at very short notice that it is not necessary to attend at all. As often as not the difference between the two sides usually has nothing whatever to do with the medical aspects of the case."

In "The Lancet" of July 1963: "Mr. Justice Glyn-Jones asked whether there was any reason why medical reports should not be exchanged. He took the poorest view of any obstructive attitude on medical reports, particularly where insurance companies were concerned. 'It ought to be their pride, as well as their duty,' he said, 'to pay the proper sum, and not to try to cut down the plaintiff's damages by any forensic device like catching him unawares.' The proper course was that the plaintiff should hand over his medical reports on the terms that, if they were not agreed, he should be entitled to know why not. He went on to say: 'The physicians and surgeons should be locked up in one of the rooms outside the court and told that they would not be allowed to come out before they agreed, if that were possible without injury to their consciences.' Mr. Justice Glyn-Jones stated that he held strong views about the exchange of medical reports. He was very impressed by the mischief of summoning physicians and surgeons from their proper work."

The legal correspondent of "The Lancet" in the same issue wrote: "The present policy of the courts is to encourage, but not to compel, the exchange of reports, though it is evident that there are still unnecessary failures to agree reports. This is not usually the fault of the doctors since they do not have the opportunity of discussing the case together. An alternative to the compulsory exchange of medical reports is a system adopted in New York State, with apparently excellent results, of securing a report from an independent doctor appointed by the court."

From 1st February 1972 to 1st February 1977 I kept records of all cases where I had been warned to attend court. There were 260 such cases. I was actually present in court for 115 of them, and, although the High Court in Chichester Street is a very elegant building when looked at from the outside, it must be one of the most uncomfortable buildings in the country. Consulting rooms are small, dirty and situated where the maximum noise of the traffic makes hearing almost impossible. The central hall where the bargaining takes place has seats for 40 people and on one occasion I counted 250 in the hall. The decisions taken in my 260 consecutive cases were as follows. Sixty-eight were settled three days before the trial. Thirty-seven were settled 12-24 hours before the trial. Eighty-four were settled at about 11.30 a.m. on the day of the trial. One was postponed because an essential witness was not present. Nine were postponed on the morning of the trial because there was no judge available.

In 22 cases the jury was sworn and the decisions taken were as follows. Five were settled just after the jury was sworn. In one there was a legal disagreement and the case was postponed. In two there was a direction from the judge and the case was postponed. In one the jury was divided and there was a re-trial. Only in 13 did the jury actually make a decision.

I have records of 118 cases in the last five years where I know the insurance company involved. There were 16 different insurance companies and, of the 16, five accounted for no fewer than 99 of the 118 cases where I had been warned to attend court. One particular company was responsible for me going to court on 39 occasions and another on 27 occasions. If you eliminate the five companies

who called me most often, the other 11 companies did not, on any occasion during the five years, call me on more than two occasions. If we take the insurance company responsible for calling me on 39 occasions, I examined 12 consecutive cases from that company and found that I had to attend court on all 12 occasions and no attempt was made to settle any of them before the day of the trial. One case was postponed because my colleague went off to Canada the next day. In one there was legal disagreement. One was taken out on the day of the trial to await the decision of another similar case. There were six jury decisions. In other words, if one is warned to attend court for this particular insurance company, you can reckon that you will be there!

There were some rather interesting individual cases. Miss F, for example, a young girl, was in court on four separate occasions and for some reason or other the case was always taken out. On the fourth occasion she took fright and accepted £300, of which none would go to her. I was told afterwards that the legal and medical costs of this particular action came to £2,500. There was an occasion when the two barristers settled the case on a Friday evening, the case being due to be heard on the following Monday, but they failed or were unable to contact their solicitors, with the result that solicitors, witnesses and doctors all turned up at court and wasted a day. The majority of the witnesses came from Enniskillen.

Most doctors who attend court have emotions ranging from sheer impatience to abject terror. The impatience and sometimes exasperation is born of the knowledge that time will be wasted and surgeries and clinics will have to be abandoned. Yet, while doctors may believe that the courts delight in keeping them hanging about for days in dingy waiting-rooms, dirty canteens and draughty halls, in actual fact a medical witness often gets preference over the lay public since his evidence is usually called first so that he can get away. A witness frequently feels that he is there to be ridiculed and abused, and I must admit that I have frequently heard an astute lawyer running the doctor through with the rapier of his tongue when the occasion demanded.

When giving evidence, medical jargon must be avoided like the plague. Even though the judge and learned counsel may know as much medicine about the case being tried at the time as the medical witness, they often pretend not to when it suits them, mainly for the benefit of the lay jury. Terminology should be simple. For example, the correct term for a black eye is not 'periorbital haematoma'. The doctor should speak up in volume and he must know when to shut up! Nothing is more joy to a barrister's heart than to hear the doctor rambling on far beyond the necessity of answering a question. To the older medical witness sitting in court it can be an interesting, if sad, experience to listen to some sadistic counsel leading a voluble doctor along a flower-strewn path to a gigantic man-trap which has been dug at the distal end. In forensic circles there has long been a saying that the doctor in court should "dress up, stand up, speak up and shut up".

Confining one's views to one's field of competence is, perhaps, as important a quality as any, because there is no more certain opening for damaging thrusts from counsel than speaking of matters where one has had, and can be shown to

have had, little or no personal experience. Professor Keith Simpson, Emeritus Professor of Forensic Medicine in the University of London, relates how the great medical witness, Sir Bernard Spilsbury, was caught napping when he ventured a clinical view on childbirth, a subject he could not possibly have dealt with for many years. When asked by counsel when it was that he had last attended the delivery of a child, he had to admit that "it must be forty years". He then successfully extricated himself by adding that he "didn't think the process had changed very much during that period". The medical witness should never be afraid of saying "I don't know" rather than flounder and wallow into some half-hearted opinion because he feels he must keep his end up. The hard school of experience makes the more wily expert witness counter probings with a judicious expression of ignorance. The doctor should always remember that he is there to help the court in the administration of justice. He is not there in a fiercely partisan role whether for prosecution or defence.

It is widely held by people outside the legal profession that if a case goes to court and is actually heard over a period of two or three days, then the barrister will command a higher fee than if he had settled the case at an earlier stage. This is not so, for the barrister's fees depend on (a) the complexity of the case; (b) the likely size of the award; the fee would be more for a case likely to be in excess of £10,000 than a case likely to be settled for half this; and (c) the importance of the case to the solicitor or the insurance company concerned; there may be other similar cases to be settled in the near future. The reputation and seniority of the barrister is important. It is entirely in the barrister's interest to get the case settled as soon as possible at a figure which would not spoil his reputation. He can then get on with another case.

Of 2,000 consecutive claims that I have dealt with, 77 per cent were, in my opinion, examples of industrial dermatitis, and another 8 per cent were examples of injuries with subsequent scarring, industrial folliculitis, and so on. Only 15 per cent, therefore, of the total had something which, in my view, was not of industrial origin. I am convinced that very few workers who claim damages against their employers are in any way dishonest or disloyal. They quite simply feel that to claim is their right. But I have met a few who did not follow the majority pattern. Mr. M was one of them. He worked for a textile firm for 10 years, during which time he wore rubber boots. He developed rubber sensitivity for which he was treated in hospital. He knew he was sensitised to rubber. He then moved to another town and found himself a new job in a rubber factory. When he was interviewed by the factory doctor of this rubber factory he denied ever having any skin disease before, and did so verbally and in writing. At the time of this interview, having been off work for several weeks, his skin was clear. Within 24 hours of starting work in the rubber factory he had developed a very severe generalised dermatitis, as you might expect. He then made a claim for damages against the rubber factory.

On the other hand, I have seen examples of claims where I believe the plaintiff was not dishonest but simply misguided. A young person from County Tyrone went into a public house and ordered a Guinness. He was the only customer in the pub. The barman poured half the bottle of Guinness into a glass and left the

bar to attend to something else. The young customer drank the glass of Guinness and then found, to his horror, that there was a dead mouse left in the Guinness bottle. He shouted to the barman, told him that there was a dead mouse in his Guinness, and left in a hurry. Some days later he developed constitutional seborrhoeic eczema. He made a claim in the County Court, before a judge sitting alone and without a jury, against the bottlers of the Guinness. Now, we do not know the cause of seborrhoeic eczema, but it is most certainly not due to dead mice in Guinness bottles. The judge awarded him £15.00, which, by coincidence, was his solicitor's fee.

We can all be wrong. Mr. F worked in an aircraft factory and was in daily contact with epoxy resin glues, notorious sensitisers. He developed light sensitivity of severe degree and walked around like Wells' Invisible Man. He wore gloves even in the hottest weather, a hat with a broad brim, his face covered at all times in bandages, and he wore dark glasses. His car had darkened glass and the blinds in his house were permanently drawn. A colleague of mine did patch testing and thought him sensitive to epoxy resin glues. The case could not have been defended successfully before a jury, so the case was settled for £12,500. Unfortunately my colleague died and Mr. F came under my care. A year or so later his particular skin condition was described as 'acitinic reticuloid' and I realised that my patient was suffering from this, nothing to do with the epoxy resins or the aircraft factory; but Mr. F had received his £12,500 and that was that.

THE PROGNOSIS

The comparatively low rate of complete cures in the field of dermatitis is illustrated by records kept at this hospital by my colleague, Dr. D. Burrows. Of 113 patients whose subsequent progress was followed over 13 to 15 years, only 24 were completely clear of the disease. Forty-four were suffering quite severe trouble.

Of 305 consecutive patients with industrial dermatitis seen by me, only 36 (about 11 per cent) had not been off work because of dermatitis. Most of those patients not off work were sent directly by their firm for purposes of diagnosis and many would subsequently go off work. Twenty-five patients (8 per cent) had been off for less than one month; 54 (17 per cent) for a year or less; 66 (22 per cent) for between one and three years, and 15 (5 per cent) for more than three years. Almost half of the 305 patients (46 per cent) were actually off work when I saw them. They were usually unemployed. Only 39 (13 per cent) remained in their original employment and usually certain changes had been made in their work routine for them to remain there. Finally, 41 per cent had changed their jobs.

We can conclude that industrial dermatitis is a very serious condition, but surely we must find a better method of assessing compensation than by a jury system with its appalling waste of man hours.

ACKNOWLEDGMENTS

I have quoted freely from our national daily newspapers, our own 'Belfast News Letter' and 'Belfast Telegraph'. I duly acknowledge this. I am grateful for much help in the legal aspects given by Mr. Owen Catchpole, Dr. Barney Martin and Dr. Peter Foster.

MODERN INSULIN AND INSULIN THERAPY IN DIABETES MELLITUS

by

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INTRODUCTION

INSULIN is a complex polypeptide hormone, prepared in crystalline form from the pancreas of suitable animals and available for the parenteral administration to patients whose endogenous supply of insulin is insufficient to maintain normal carbohydrate metabolism. About one-third of diabetic patients need insulin, and a great variety of commercial preparations, some newly introduced on the market, are available for their treatment.

PREPARATIONS OF INSULIN*

Much of the insulin used in Britain has, until recently, been derived from ox pancreas, whereas pork insulins predominate in Europe. All standard insulin preparations are impure and stimulate the production of antibodies. Pork insulins are less antigenic than beef since the structure of the former resembles the human form more closely than the latter. Newer highly purified pork insulins have been subjected to further re-crystallization and gel-filtration, and only rarely provoke antibody formation. Purified beef insulin preparations from which immunogenic proinsulin has been largely removed (less than 20 ppm) have just been introduced.

Preparations of insulin can be divided into three groups, depending on their length and speed of action, namely, short-acting with rapid onset, intermediate and long-acting. Except for the short-acting soluble insulins, all other types have been modified to delay absorption and increase the duration of action. This is achieved by the addition of zinc or a protein, or both, in the presence of a suitable buffer.

SHORT-ACTING INSULINS

Soluble insulin (insulin injection BP, unmodified or regular, SI) is a clear aqueous solution of beef insulin with a pH of 3.0 to 3.5. SI acts quickly and more intensely than the modified insulins.

Neutral soluble insulin (Nuso, neutral injection BP) is a crystalline insulin derived from beef or pork pancreas with a pH of 6.6 to 7.7 *Actrapid MC* (Novo) and *Insulin Leo Neutral* (Nordisk) are neutral highly purified pork insulin preparations. *Semilente* is a neutral suspension of zinc insulin (IZS) in amorphous form prepared from beef or pork insulin, and *Semitard MC* (Novo) is the equivalent in highly purified pork insulin. *Semilente* (Novo) is proinsulin free (PIF) pork insulin.

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* A detailed list of the preparations of insulin in current use may be obtained from Dr. Marie Maguire, Drug Information Centre, The Pharmacy, Royal Victoria Hospital, Belfast BT12 6BA.

Because of their fast action, the soluble insulins are the preparations of choice for the treatment of diabetic ketosis and coma and for surgical emergencies. When injected subcutaneously their action lasts from ½ to 8 hours, with a peak between 1½ and 4 hours. Neutral soluble insulin and the highly purified pork preparations have a slightly faster rate of action than SI, probably because the pH of the latter has to rise before it becomes biologically active and possibly to a lack of insulin binding in the plasma by the purified insulins. The action of Semilente and Semitard lasts between 1½ and 14 hours and is at its peak between 4 and 9 hours.

INTERMEDIATE INSULINS

Isophane insulin BP (*NPH*) is a suspension of beef crystalline insulin, protamine and zinc, buffered with phosphate (pH 7.1 to 7.4). *Leo Retard* is a neutral, highly purified micro-crystalline pork isophane preparation. Both SI and Leo Neutral can be mixed with their appropriate isophane preparation (beef for the former and pork for the latter) without causing loss of action of either due to precipitation of free zinc. *Mixtard* (*Leo*) is a preparation containing a mixture of Leo Neutral (30 per cent) with Leo Retard (70 per cent). *Globin zinc insulin BP* is an acidic solution of beef insulin, modified by the addition of a suitable globin and zinc (pH 3.0 to 3.5). *Biphasic insulin BP* is a neutral mixture of beef insulin crystals (75 per cent) suspended in a solution of pork insulin. *Rapitard* (*Novo*) consists of a mixture of PIF beef insulin crystals in a solution of highly purified pork insulin. *Lente insulin* (*IZS*) is a neutral mixture of seven parts of crystalline zinc suspension (Ultralente) and three parts of amorphous suspension (Semilente). *Lentard* (*Novo*) is a PIF beef preparation of Lente. *Monotard MC* (*Novo*) is the highly purified pork equivalent of Lente.

The action of Isophane, Leo Retard, Globin Zinc and Rapitard commences at 1½ hours and continues for 24 hours, with maximum effect between 4 and 12 hours. There are minor variations between the different preparations. Lente, Lentard and Monotard have a slightly slower onset of action (2½ hours) and last fully 24 hours, with the peak response between 6 and 14 hours.

LONG-ACTING INSULINS

Protamine zinc insulin (*PZI*) is a combination of beef or pork insulin with added protamine and zinc, phosphate buffered to a pH of 6.9 to 7.3. *Ultralente insulin* (*IZS*) is a neutral suspension of crystalline beef insulin. *Ultratard* (*Novo*) is a PIF preparation of Ultralente. Onset of action of these preparations is delayed for 4 hours and continues for 30 or more hours, depending on the dose, with the maximum effect between 10 and 18 hours.

Highly purified pork insulins were introduced for clinical use in Britain in 1975. These insulins differ from standard beef or pork insulin and patients accustomed to ordinary preparations may develop hypoglycaemia if they are changed to an equivalent dose of a highly purified insulin because of lack of resistance. Highly purified pork insulins do not give rise to antibodies in previously untreated diabetics, or, if they do, these are of very low titre, and there may be a modest, sometimes substantial drop (immediate or delayed) in insulin requirement on

changing to a purified preparation. A 20 per cent reduction in dose is advisable when substituting one of these preparations and further adjustments, either up or down, should be carefully supervised. Cutaneous sensitivity reactions and lipoatrophy have been largely abolished, and remission periods are said to last longer.

Purified beef insulins, from which immunogenic proinsulin substances have been largely reduced (less than 20 ppm) became available for clinical use early in 1976. Patients currently maintained on Novo Lente, Ultralente and Rapitard can be changed to the equivalent PIF preparation without readjustment of the dose.

INSULIN STRENGTHS

Insulin is standardised in International Units to ensure that the dose remains constant. With few exceptions, insulin is available in 40 and 80 unit strengths. Recently, preparations containing 100 units per ml (U-100) have been introduced in the USA and Canada with the object of phasing out U-40 and U-80. However, U-40 and U-80 preparations are still listed in the USP (18th ed., 1975).

INDICATIONS FOR INSULIN THERAPY

Insulin is required for the treatment of diabetic ketosis and for all diabetics who cannot be kept in good health without it. It should be avoided in the obese, unless it is required temporarily to treat ketosis, to cover infections, surgical operations and to relieve diabetic vulvitis. Insulin is usually indicated for patients with active retinopathy, neuropathy or nephropathy, for young diabetics with cataracts and during pregnancy. Obese patients with complications, however, gain little from the addition of insulin if the blood glucose can be kept at normal levels without it.

METHODS OF USING INSULIN

The range of insulin preparations is such that it should be possible to achieve excellent control in most stable diabetics and good control in the majority of brittle diabetics. The selection of a suitable regime depends on the patient, the nature of the diabetes and the experience of the physician.

TWICE DAILY REGIMES

Soluble insulin, Nuso, Actrapid MC and Leo Neutral, injected 10 to 20 minutes before the morning and evening meals, are used for the initial stabilisation of new diabetics and for the treatment of diabetic ketosis and other complications. It is probably advisable now to start new diabetics on a highly purified pork or beef preparation. The disadvantage of extra cost (approximately the same to more than twice as expensive) is balanced by smaller doses and freedom from allergic side effects.

When employed twice daily they usually provide control of the plasma glucose level equal or superior to most single dose injection regimes. The chief disadvantage is the short duration so that patients with severe diabetes frequently show *hyperglycaemia* for some hours before the next injection of insulin is due. This fluctuation makes stabilisation difficult and *hypoglycaemia* results if the dose of

SI is increased in an attempt to control the hyperglycaemia peak, but it can often be overcome by combining Isophane with one or both doses of SI, allowing 3 or 4 units of Isophane for each unit of SI. This combination prolongs the action of the insulin and allows a reduction in the dose of SI and the danger of hypoglycaemia. A similar effect can be achieved with a combination of Actrapid MC or Semitard MC and Montard MC, by a mixture of Semilente and Lente insulin or Leo Neutral and Retard. The combination of a quick and intermediate-acting insulin twice daily provides the most effective control for patients with severe or brittle diabetes.

Single dose regimes

Any of the intermediate insulins (Isophane, Leo Retard, Lente or Monotard MC) may provide acceptable control for 18 to 24 hours after a morning injection. The method is satisfactory for mild diabetics (approximately one-third of those requiring insulin). These preparations frequently provide good control in the afternoon and evening without affecting appreciably the morning hyperglycaemia. The administration of a short-acting insulin (SI, Leo Neutral, Actrapid MC or Semitard MC) with the morning dose or the use of Mixtard or Rapitard may avoid this difficulty. Sometimes the converse is seen, when control in the morning and afternoon is good, but hyperglycaemia returns in the evening and persists overnight. Such a pattern requires the addition of a second dose of a quick-acting or intermediate insulin before the evening meal. Alternatively, the effect of a morning dose of Lente or Lentard can be protracted by the addition of some Ultralente or Ultratard. Patients needing more than 60 units per day can rarely be controlled satisfactorily on a single morning injection of an intermediate or long-acting preparation. In general, single dose regimes are unsuitable for children and adolescents, pregnant diabetics, for patients with diabetic complications, for those with infections or ketosis and for those undergoing surgical operations.

INSULIN MIXTURES

Soluble insulin and Isophane can be injected together in the same syringe without their individual actions being altered significantly. Various combinations of the insulin zinc suspensions and highly purified insulins may be tried to obtain relatively constant plasma glucose levels throughout the 24 hours. Actrapid MC, Leo Neutral, Semilente or Semitard MC may be added to Lente to increase the speed of action earlier in the day, or Ultralente may be added to Semilente or Lente, or Monotard MC to Semitard MC, to provide a protracted effect. It must be noted that the non-antigenic properties of highly purified insulins are destroyed if they are mixed with insulins which are not of highly purified pork origin. The admixture of SI and Lente is not recommended, since the two preparations differ in pH; Actrapid MC or Nuso are preferred.

ADVERSE REACTIONS TO INSULIN

These may be local or general. A *local stinging* or a *tender indurated swelling* at the site of injection is seen in about 40 per cent of patients seven to ten days after insulin treatment has been started with the older preparations. The cutaneous

swellings may persist for a few weeks and subside spontaneously. Unless severe, the patient should be reassured and treatment need not be interrupted. Should they persist it is advisable to change to a highly purified preparation. *True insulin allergy* is rare and is similar to the allergy caused by other antigens. Most insulin allergies occur with modified insulins derived from the more antigenic beef preparations, so that it may be necessary to rely on a highly purified neutral pork soluble insulin. *Lipoatrophy* (insulin atrophy) is the most frequent long-term adverse reaction to standard insulins but it is rarely seen with the new purified preparations. The cause is unknown although antigenic impurities of insulin may be a factor and, until recently, there was no reliable cure. Recently it has been shown that the injection of neutral soluble insulin into the affected area or changing to a highly purified preparation is beneficial. *Lipohypertrophy* is rare and consists of a large subcutaneous mass of fatty tissue which develops at the site of repeated injections of insulin. The swelling may disappear when insulin is no longer injected, but large tumours may require surgical removal.

CONCLUSIONS

The variety of current insulin preparations is so extensive that the successful treatment of all insulin-dependent diabetics should be possible whether they are stable or not. Unfortunately, the range is so wide that few general physicians can gain expert knowledge of all varieties. However, the soluble insulins, Isophane, the highly purified preparations and the insulin zinc suspensions cover the needs of most patients. Special combinations, arrived at by trial and error, are usually necessary for the minority with brittle diabetes.

ACKNOWLEDGMENTS

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CLINICAL EXPERIENCE WITH THE NEW INSULINS

by

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CONVENTIONAL insulins contain several impurities such as proinsulin, C-peptide, polymers of insulin (Steiner *et al,* 1968) and other pancreatic peptides (Bloom *et al,* 1976). All are immunogenic (Schlichtkrull *et al,* 1972) and may lead to the development of insulin-binding antibodies in patients using insulin preparations containing them. As a result, some patients develop local skin sensitivity, lipoatrophy or lipohypertrophy at the site of insulin injection. A few develop resistance to insulin and require very large daily doses of insulin to control their diabetes.

Highly purified insulin preparations are now available (Montgomery, 1977). They contain less impurities and have been reported to cause less complications (Bruni *et al,* 1973). In order to assess their effectiveness, two groups of patients have been studied. Thirty-seven patients were changed electively from conventional beef insulin to highly purified pork insulin, and 16 patients with juvenile onset diabetes were treated with highly purified pork insulin from the time of diagnosis.

PATIENTS

The patients all attend the Diabetes Clinic of the Royal Victoria Hospital, Belfast. Those transferred to highly purified pork insulin were selected because of poor control of their diabetes, high dose of beef insulin, early microvascular changes or evidence of local reactions to beef insulin such as skin sensitivity, lipoatrophy or lipohypertrophy.

At intervals during the six months before transfer to highly purified insulin, daily insulin dose, 2 to 3 hour post-prandial plasma glucose, body weight and dietary intake were recorded for each patient. These continued to be recorded during the follow-up period of 6 to 12 months. The patients were asked to report any hypoglycaemic attacks which occurred during the period of study. All were admitted to hospital initially because of reported concern about severe hypoglycaemic reactions following transfer to highly purified insulin (Asplin and Hartog, 1976). They were changed either to Leo Neutral and Leo Retard (Nordisk) or to Actrapid MC and Monotard MC (Novo). These patients were divided into three sub-groups depending on their mean daily dose of insulin during the six months before changeover (Table 1).

The patients treated with highly purified insulin from the time of diagnosis had daily insulin dose, 2 to 3 hour post-prandial plasma glucose and body weight recorded during a follow-up period of six months. These were compared with the results for a similar group of patients, started on conventional insulin five years ago, who were matched for age, sex, body weight and dietary intake.

TABLE 1: PATIENTS CHANGED FROM CONVENTIONAL BEEF INSULIN TO HIGHLY PURIFIED PORK INSULIN WITH SUB-GROUPS ACCORDING TO THEIR MEAN DAILY DOSE OF INSULIN.

Sub-Group	*Mean daily insulin dose prior to changeover*	*Number of patients*	*Mean age ±S.E.M. in years*	*Mean Number of years diabetes ±S.E.M.*
A	40 units or less	10	47.7±5.1	17.4±3.5
B	41-80 units	17	39.2±5.2	8.9±1.6
C	More than 80 units	10	28.7±4.7	11.8±3.1

RESULTS

The effect on daily insulin dose of changing to highly purified pork insulin is shown in Fig. 1. There were marked variations within each sub-group. In sub-group A seven patients showed changes of less than 10 per cent in daily insulin dose after transfer to highly purified insulin. The other three patients showed a rise of more than 10 per cent. In sub-group B eight patients showed a change of less than 10 per cent, four an increase of more than 10 per cent, and five a decrease of more than 10 per cent. In sub-group C four patients showed a change of less than 10 per cent, one an increase of more than 10 per cent, and five a decrease of more than 10 per cent. One patient in this sub-group showed a decrease of 79 per cent in daily insulin dose one month after changing to highly purified insulin. This was maintained during the follow-up period.

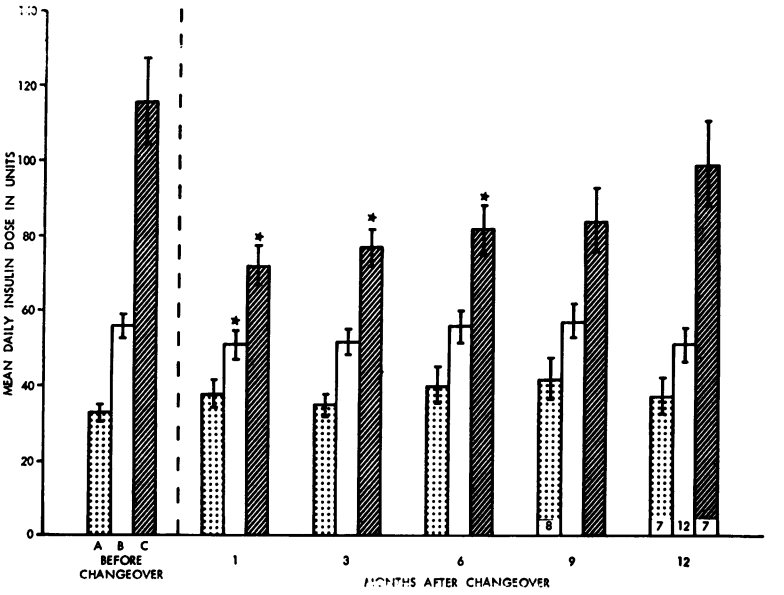

FIGURE 1: MEAN ±S.E.M. DAILY INSULIN DOSE BEFORE AND AFTER CHANGEOVER TO HIGHLY PURIFIED INSULIN (*$P<0.05$). NUMBERS IN COLUMNS INDICATE NUMBER OF PATIENTS REPRESENTED.

No significant change in dietary intake occurred in any of the sub-groups, which is reflected by the absence of any major change in body weight (Fig. 2). Degree of diabetic control is difficult to assess. Figure 3 shows mean 2 to 3 hour post-prandial plasma glucose of the three sub-groups. These were in the 10-15 mmol/l range before transfer and are disappointingly high, but despite increased efforts to improve control after changing to highly purified insulin, plasma glucose levels did not change significantly in sub-groups A and C. There was a transient improvement in sub-group B which was not associated with any significant change in insulin dose. No increase in clinical hypoglycaemia attacks occurred after changeover to highly purified insulin. Three patients in this group with local skin sensitivity to conventional insulin showed no sensitivity with highly purified insulin. Six other patients with lipoatrophy or lipohypertrophy showed improvement when changed to a purified preparation.

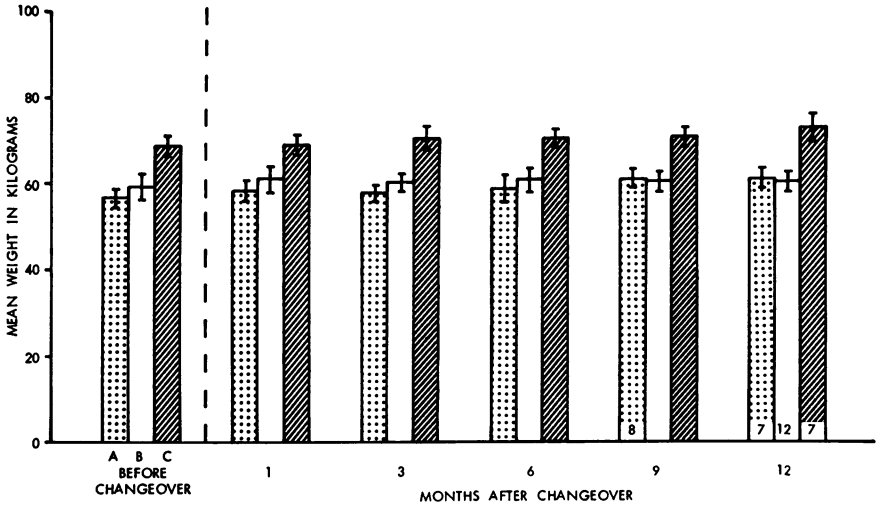

FIGURE 2: MEAN ±S.E.M. BODY WEIGHT BEFORE AND AFTER CHANGEOVER TO HIGHLY PURIFIED INSULIN. NUMBERS IN COLUMNS INDICATE NUMBER OF PATIENTS REPRESENTED.

The daily insulin dose in the patients started on highly purified insulin at the time of diagnosis was slightly higher but not significantly different from that in the patients on conventional insulin. However, only those on highly purified insulin showed a fall in daily insulin dose during the follow-up period (Table 2). Dietary intake and body weight showed no change in either group. There was a significant fall in 2 hour post-prandial plasma glucose in the group on highly purified insulin but not in those on conventional insulin.

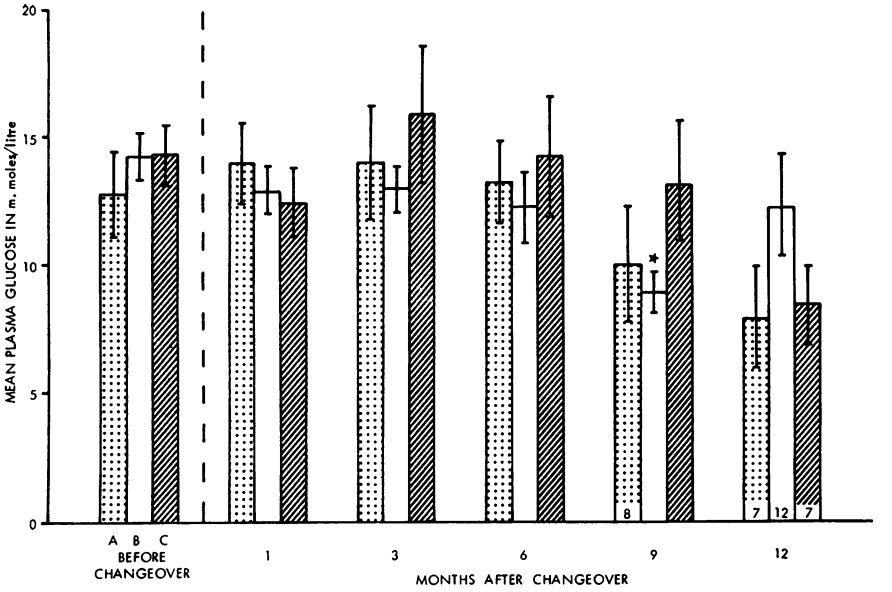

FIGURE 3: MEAN ±S.E.M. 2 TO 3 HOUR POST-PRANDIAL PLASMA GLUCOSE BEFORE AND AFTER CHANGEOVER TO HIGHLY PURIFIED INSULIN (*P<0.05). NUMBERS IN COLUMNS INDICATE NUMBER OF PATIENTS REPRESENTED.

TABLE 2: MEAN ±S.E.M. DAILY INSULIN DOSE IN UNITS (PURIFIED AND CONVENTIONAL) IN PATIENTS WITH JUVENILE ONSET DIABETES (*P<0.05).

Type of insulin	*One month after starting insulin*	*Three months after starting insulin*	*Six months after starting insulin*
Highly purified	40.8±4.0	35.5±3.2*	31.1±3.2*
Conventional	31.6±2.6	32.8±3.3	34.0±4.2

DISCUSSION

With the advent of highly purified insulins it has become important to decide which patients should receive them. These results are similar to those from many other centres in showing that patients with local skin sensitivity, lipoatrophy or lipohypertrophy on conventional insulin are much improved on highly purified insulin. Patients on very high doses of conventional insulin, usually due to the presence of high titres of insulin-binding antibodies, also benefit by getting a substantial reduction in daily insulin dose. However, for the majority of patients there is either no reduction or only a modest reduction in insulin dosage. Further-

more, no improvement in their diabetic control was observed so that it is unlikely that the diabetic who is well or moderately controlled on conventional insulin will gain any therapeutic benefit from changing to a highly purified preparation. Insulins from both Danish manufacturers were used in this study and no important differences were observed between them.

The group of juvenile onset diabetics started on conventional insulin showed no change in insulin dose after six months. However, after five years, nine of the patients, in whom comparison was valid, showed a very marked rise from a mean of 31.8 to 50 units/day in the absence of change in weight, dietary intake or 2 to 3 hour post-prandial plasma glucose. Information on long-term follow-up of the patients on highly purified insulin is not available, but Andreani *et al* (1974) showed that there was no increase in insulin dose up to two years with these less immunogenic preparations. It would therefore seem reasonable to use these insulins in patients receiving treatment for the first time. Whether this will result in any improvement in the long-term complications of diabetes remains to be seen.

SUMMARY

Clinical experience with the new insulins in two groups of patients is described. In a group of 37 patients, changed electively from conventional beef insulin to highly purified pork insulin, only those on more than 80 units/day of beef insulin showed a marked fall in insulin dosage after changeover. This fall was not maintained up to one year in the majority of patients. There was no improvement in diabetic control after changeover, but marked improvement in local reactions to insulin did occur. Sixteen patients with juvenile onset diabetes were treated with highly purified pork insulin from the time of diagnosis. There was no significant difference in insulin dosage during the first six months of treatment compared with that in a similar group of patients started on conventional insulin five years ago. Those on conventional insulin showed a marked rise in insulin dosage after five years. Information on long-term follow-up of those on highly purified insulin is not available. Indications for the use of the new insulins are discussed.

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NOSOCOMIAL ROTAVIRUS GASTROENTERITIS IN A NEONATAL NURSERY

by

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A NEWLY recognised virus has recently been seen in duodenal mucosa from children with acute non-bacterial gastroenteritis (Bishop *et al,* 1973). Subsequently, Flewett, Bryden and Davies (1973) found the virus in negatively stained faecal extracts. Similar viruses have since been detected throughout the world and there is convincing evidence that this virus, provisionally called rotavirus, is an important aetiological agent in acute childhood gastroenteritis. We describe a hospital acquired (nosocomial) outbreak of infective diarrhoea in a newborn maternity unit. This is the first report of a rotavirus outbreak in Ireland.

PATIENTS AND METHODS

Clinical details

The outbreak began on 20th November 1974 in the neonatal unit of the Royal Maternity Hospital, Belfast, and new cases of gastroenteritis occurred until 10th December 1974. During this period 61 babies passed through the unit. Fourteen babies, six of whom were male, were affected (Table 1) and this included two sets of monozygotic twins, one of each sex. All infants had diarrhoea but in only two was there associated vomiting; this occurred at the onset of the illness. Diarrhoea was watery and often green in colour at onset, but it was variable both in frequency and duration. In the group as a whole the mean duration of symptoms was 8.3 days, while in the seven babies of birthweight less than 2.0 kg it was 12.6 days; in heavier infants it was only 4.0 days. Eight infants (five of them less than 2.0 kg birthweight) took more than 2.5 weeks to regain their birthweight. In three there was an electrolyte disturbance, two had hyponatraemia, one had hypokalaemia and two an elevated urea. Eight required intravenous fluid therapy, in some for up to 7 days. In two infants, birthweights 1.8 and 1.2 kg, there was some sugar intolerance, although this was not critically studied. Upper respiratory tract infection was not observed in any of the affected infants. Ultimately all infants recovered and there were no deaths.

TABLE 1: RELATIONSHIP OF DIARRHOEA TO ROTAVIRUS INFECTION

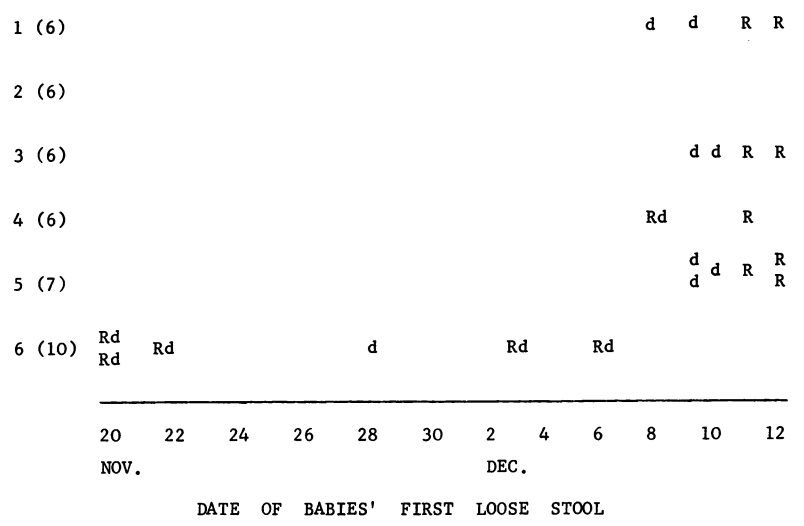
Rotavirus infection	*Diarrhoea mild/severe*	*No diarrhoea*	*Total*
Confirmed	0/6* (3)	8 (4)	14
Not confirmed	6/2* (3)	9 (3)	17

*One infant in each group with vomiting. Number of males shown in brackets.

The neonatal unit has a capacity for 41 babies and is divided up into six cubicles. Diarrhoea commenced in cublcle 6, an area where 10 babies can be nursed, and was confined to this area for 17 days, although six infants had developed symptoms (Table II). Between 8th and 10th December babies in cubicles 1, 3, 4 and 5 began having diarrhoea in spite of great care being taken to confine the infection to cubicle 6. The usual methods of gowning, hand washing and keeping each baby's feeding utensils strictly for the individual concerned were employed. The babies were all bottle fed. The nursing and medical staff involved in the daily care of these infants were also responsible for those in the other five cubicles of the nursery. The only area with no infected babies was cubicle 2. None of the mothers questioned had had recent diarrhoea or vomiting, nor did any of the staff develop symptoms. The outbreak was terminated by closing the unit to further admissions on the 12th December.

TABLE II

TEMPOROSPATIAL SPREAD OF ROTAVIRUS INFECTION IN NURSERY



DATE OF BABIES' FIRST LOOSE STOOL

The origin of infection in our infants was not discovered, although the source may have been a baby initially thought to have subacute bowel obstruction admitted to the nursery from a postnatal ward on 17th November. This infant

had mild diarrhoea, vomiting and abdominal distension. Bacterial cultures were negative. Symptoms abated within 48 hours and the baby was discharged. Three days later, however, infants in the same nursery cubicle of the unit developed diarrhoea. Moreover, two weeks after discharge an infant who had been in an adjacent cot to this baby in the postnatal ward was admitted to the local fever hospital with gastroenteritis. Neither was examined for rotavirus infection, but no other cause for the symptoms was found.

LABORATORY STUDIES

On 11th and 12th December suitable faecal samples were obtained from 29 infants and blood samples were taken from 11 infants. Both faeces and sera were stored at —20°C.

Bacteriological culture of faeces was carried out on blood agar and MacConkey's agar. Electron microscopy of five faecal samples was performed after differential centrifugation and negative staining, using the method of Bishop *et al,* 1974. For rotavirus culture faecal extracts were centrifuged on to coverslip monolayers of LLC-MK2 cells, and after incubation the cells were stained with a fluorescein isothiocyanate conjugated (FITC) rabbit anti-rotavirus serum to detect rotavirus antigen (Bryden *et al,* 1977). Faeces were tested after 18 months storage at —20°C. Rotavirus antiserum was prepared as follows. Purified Nebraska calf diarrhoea rotavirus in Freund's complete adjuvent was injected intramuscularly into each limb of a rabbit. After one month a further dose was given intravenously and the antiserum was removed a week later. Rotavirus specific immunoglobulins IgM and IgG: the infants' sera and FITC anti-human IgM or anti-human IgG were absorbed with LLC-MK2 cells. In addition, the infants' sera were inactivated at 56°C for 30 minutes. For detection of rotavirus specific IgM, the sera were further absorbed with *Staphylococcus aureus* protein A and heat aggravated human immunoglobulin, using the method of Thompson *et al,* 1975. Rotavirus specific IgM or IgG was measured by the indirect fluorescent antibody technique with suitable controls. Coverslip cultures of acetone fixed LLC-MK2 cells infected with Nebraska calf diarrhoea virus were covered with FITC anti-human IgM or IgG for one hour at 37°C. After further washing, the coverslips were mounted and viewed with a fluorescence microscope.

RESULTS

All bacterial cultures were negative for faecal pathogens, whether from infants with or without diarrhoea. Rotaviruses were detected by electron microscopy in three out of the five faeces examined. Of faecal samples from 29 infants, rotaviruses were cultured from 11 infants; 18 were negative. Rotavirus specific IgM was detected in sera from five of 11 children (Table 3). Of these, nine had faeces tested for rotavirus which was detected in two infants who had rotavirus specific IgM and in one infant who had no detectable specific IgM. Three babies had rotavirus specific IgM in their sera but rotavirus was not found in the faeces. Rotavirus specific IgM was negative in a further five infants, in three of whom

rotavirus was not detected in faeces. Two babies had no faeces samples tested. Rotavirus specific IgG was found in the acute phase sera of six out of six children tested. In two of these rotavirus was not cultured nor was rotavirus specific IgM found in serum.

TABLE 3: RELATIONSHIP OF ROTAVIRUS STOOL CULTURE TO ROTAVIRUS SPECIFIC IgM

Rotavirus stool culture (*Twenty-nine babies*)	*Rotavirus Specific IgM* (*Eleven babies*)	
	Positive	*Negative*
11 Positive	2	1
18 Negative	3	5

Fourteen of 31 children (45 per cent) had laboratory confirmation of rotavirus infection in infants who had diarrhoea, and those who remained well is shown in Table 1. Rotavirus infection was confirmed in six of eight infants with severe diarrhoea, but in none of the six babies who had mild diarrhoea. In those with diarrhoea there was a confirmation rate for rotavirus infection of 43 per cent. Of particular interest were the eight of 17 (47 per cent) asymptomatic infants who were found to be infected with rotavirus on the 11th and 12th December. Of the two pairs of twins with diarrhoea, rotavirus infection was confirmed in the male twins but not in the female pair.

DISCUSSION

In this outbreak rotaviruses were strongly associated with gastroenteritis since faecal bacterial pathogens were excluded. The fluorescent antibody method for detecting rotavirus antigen in infected cells was more convenient than direct electron microscopy of faeces and is known to give similar isolation rates (Bryden *et al,* 1977). This should not be influenced by storage of faeces at —20°C because the virus is thermostable. Moreover, the detection of rotavirus specific IgM in five out of 11 infants tested indicates recent infection with rotaviruses since IgM, unlike IgG, does not pass the placenta (Davidson *et al,* 1975). Some of the sera, however, may have been taken too early for detection of rotavirus specific IgM.

Diarrhoea was the prime clinical manifestation. This was marked in eight babies (57 per cent), which included five babies less than 2 kg birthweight, indicating that smaller, less mature infants are more at risk. Vomiting occurred in only two of the 14 babies with diarrhoea but may be a more common symptom in older children (Shepherd *et al,* 1975). Upper respiratory signs were not noted in this outbreak but have been documented in 42 per cent of older babies with rotavirus gastroenteritis (Carr, McKendrick and Spyridakis, 1976).

Outbreaks of gastroenteritis in newborn nurseries have been reported from various cities: London, Glasgow, Sydney, Melbourne and Paris (Chrystie *et al,* 1975; Madeley and Cosgrove, 1975; Murphy, Albrey and Hay, 1975; Cameron *et al,* 1975; and Weekly Epidemiological Record, 1977a). The incidence of rota-

virus infection in the community is highest during winter months, and hospital outbreaks may reflect this, but nosocomial rotavirus infections are found at other times of year (Chrystie *et al,* 1975). During this outbreak in the winter of 1974 there was a marked increase in rotavirus infections reported in England and Wales (Weekly Epidemiological Record, 1977b).

Of the 31 infants tested, whether symptomatic or not, rotavirus infection was proven in 45 per cent. This is the same rate of confirmation as reported by Chrystie *et al,* 1975. Of greater interest were the eight of 17 asymptomatic infants who were infected with the virus, although there was circumstantial evidence that an infant with gastroenteritis may have started this outbreak. Other possibilities include an asymptomatic mother or member of staff who may have been excreting rotavirus. This is particularly relevant since it has been reported that only 11 per cent of adult family contacts of infected children were symptomatic, although 41 per cent had serological evidence of infection. These adults also had rotavirus antibody in acute phase sera, suggesting that previous childhood infection with the virus may modify a serious infection to a mild or inapparent one (Kim *et al,* 1977).

The mode of spread of rotaviruses through the cubicles is also unknown, although similar rapid spread has been reported in other neonatal outbreaks. The temporal and spatial spread is characteristic of a nosocomial infection. Infectious droplets are created during changes of napkins, hence airborne infection is possible, but it is more likely that the virus was transmitted on the hands of attending staff despite meticulous hand-washing. This is probable because rotavirus is thermostable, with up to ten thousand million viruses present per gram of faeces, so that transmission on the hands is virtually inevitable (Lancet, 1976). Furthermore, asymptomatic attending staff may have been excreting rotaviruses after being infected by the patients.

Since the newborn gut is microbiologically sterile, it seems likely that rotavirus caused the first infection in these infants. The newborn is therefore analagous to the immune adult in that most babies will have circulating transplacental rotavirus specific IgG. Indeed, rotavirus specific IgG was found in the acute phase sera of six infants who were tested, but it clearly did not provide absolute protection against infection. Adults who have had rotavirus infection during childhood, when reinfected, also mount a rapid secondary rotavirus specific IgA response in the gut which may modify symptoms. The newborn, however, is at a disadvantage because virus induces a primary IgA response in the gut which is slower and may be further delayed by immunological immaturity of the host. Breast-fed infants, on the other hand, ingest antibody which is predominantly IgA and presumably contains a rotavirus specific portion. Our babies were all fed modified cow's milk formula, but in a similar outbreak in a London maternity hospital, rotavirus was isolated less frequently from breast as compared to bottle-fed babies (Chrystie *et al,* 1975). There is as yet no explanation for the fact that eight babies infected with rotavirus were asymptomatic, although such patients are common in many other virus infections.

We would recommend, therefore, that in future those infants with infective diarrhoea and adjacent asymptomatic babies be immediately isolated from other infants. All of these should be cared for by medical and nursing personnel who have no responsibility for other infants in the nursery. Disposable gowns and gloves should be worn during handling. Finally, potentially infected infants should be tested for rotavirus infection before being admitted to the general nursery area.

SUMMARY

A nosocomial outbreak of rotavirus gastroenteritis is described in a neonatal nursery. Fourteen infants had diarrhoea but only two infants had associated vomiting. Six of 14 infants (43 per cent) with diarrhoea and eight of 17 (47 per cent) infants without symptoms had evidence of rotavirus infection. The infection was confined to one cubicle for 17 days, then spread rapidly into four other cubicles. Suggestions are made for containing future outbreaks.

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ADDENDUM

Since this paper was prepared, rotavirus antibody has been found in human colostrum (Thouless, Bryden and Flewett, 1977; Simhon and Mata, 1978).

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THE BELFAST SMOKING WITHDRAWAL CENTRE: A PRELIMINARY REPORT

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MANY methods of assisting smokers to give up tobacco have been described, such as the use of pamphlets, posters, hypnosis, aversion therapy, individual counselling and group clinics (Delarue, 1973; Russell *et al,* 1976; and West *et al,* 1977). In 1974 a survey revealed that in Northern Ireland no medically supervised organisation existed to cater for individuals seeking help to stop smoking (Scott, Nabney and McCullough, 1974). The results obtained by smoking withdrawal clinics in the U.K. and U.S.A. varied considerably, and on the whole were rather discouraging (Ejrup, 1964; Ball *et al,* 1965; and Conrad, 1971). Nevertheless, it was felt worthwhile to carry out a two-year study of the value of a Belfast-based smoking withdrawal centre, in which a variety of methods would be used to help smokers to stop smoking (Wood, 1977). This preliminary communication presents the results of the centre's first year of operation.

ORGANISATION AND METHODS

The smoking withdrawal centre operates in the premises of and with the financial support of the Ulster Cancer Foundation. By means of leaflets circulated to doctors and dentists and by publicity in the media, the attention of the medical and lay public was drawn to the existence of the centre. The sessions are held weekly and no charge is made for attendance. At the initial visit each client is interviewed by one of the authors and relevant social and medical details such as age, sex, cigarette consumption and symptoms related to tobacco are recorded. Clients with symptoms suggesting the need for further investigation are referred to their general practitioner. Height and weight are measured, and respiratory function is assessed by means of a vitalograph.

Having taken time to establish rapport with the new client, the doctor gives him several booklets setting out the hazards of smoking and suggesting several alternative modes of stopping. Each client is given a "smoking chart" in which each day of the week is divided into compartments, and he is asked to record with a mark in the appropriate compartment of the sheet every cigarette smoked. It has been shown that this activity focuses the smoker's attention on the magnitude of his problem and enables advice to be concentrated on periods of peak consumption (Ball, Kirby and Bogen, 1965; Scott, 1977).

Following this short session of individual counselling, all the clients see a film from the centre's film library. These films seek in different ways to present the facts about the serious damage to health caused by cigarette smoking. Afterwards a one-hour group therapy session is held, with the film acting as a stimulus to discussion. Members of the group recount their own smoking problems and help each other by describing how they overcame them. The group leader simply prevents discussion from wandering from the subject, and the doctor provides factual information. Clients who have already stopped smoking discuss how they overcame the difficulties experienced after stopping smoking, and those who have stopped smoking longest encourage those who have just stopped.

Clients are asked to attend six consecutive weekly evening sessions. At second and subsequent visits clients chat informally amongst themselves before the film and group discussion. They are urged to have stopped smoking completely by the third or fourth visit. Having completed the six-week cycle, clients are welcome to attend periodically, both to strengthen their resolve to remain non-smokers and to encourage new clients. Clients requiring support during the week can telephone the centre and either speak to one of the staff or listen to a pre-recorded message on tape. Clients are being reviewed after six months and thereafter will be followed up at yearly intervals.

RESULTS

One hundred and sixty-four clients (69 men and 95 women) attended at least one full session at the centre. Ninety-seven (59 per cent) had heard of the centre through publicity in the press and on television, and 17 through finding leaflets about the centre in doctors' and dentists' waiting-rooms. Nine were referred by doctors and 41 came on the recommendation of clients who had already attended the centre. One hundred and thirty-four clients (82 per cent) cited concern for their health as the principal reason for deciding to stop smoking. Eighteen (11 per cent) said that their principal reason was financial, and 12 (7 per cent) gave other reasons, usually related to their family. Cough was the commonest symptom reported by clients.

The ages at which clients had started to smoke regularly are indicated in the figure. The mean age of commencing regular smoking was 17.5 years. The mean cigarette consumption recorded at the first visit was 29.8 daily. Forty-three per cent smoked 30 cigarettes or more daily.

The short-term success rate, defined as complete abstinence from smoking for one week or more at the time of the last visit to the centre, was related to the number of attendances (Table 1). Twenty-six of the 40 clients (65 per cent) who attended at least five of the six sessions in the withdrawal programme were successful. Information concerning the success rate among the 69 clients who attended only once is lacking, but for purposes of judging the overall success rate they were all assumed to have failed to stop smoking. This gives an overall success rate of 21 per cent.

Overall 29 per cent of men stopped smoking and 16 per cent of women (Table 2). Clients who initially smoked 30 cigarettes or more daily had a success rate of 23 per cent compared with 20 per cent among those who smoked less heavily (Table 3).

TABLE 1

Number of attendances	*Corresponding number of clients*	*Number stopped at last visit*	*Short-term success rate per cent*
1	69	?	?
2–4	55	9	16
5 or more	40	26	65
Total	164	35	21

TABLE 2: SHORT-TERM SUCCESS RATE ANALYSED BY AGE

164 clients attending	*Sub-group*	*Number*	*Successful (Short-term)*
	Men	69 (42%)	20 (29%)
Sex	Women	95 (58%)	15 (16%)
	Total	164 (100%)	35 (21%)

TABLE 3: SHORT-TERM SUCCESS RATE ANALYSED BY INITIAL CIGARETTE CONSUMPTION

164 clients attending		*Number*	*Successful (Short-term)*
Cigarette	<30/day	93 (57%)	19 (20%)
consumption	>30/day	71 (43%)	16 (23%)
	Total	164 (100%)	35 (21%)

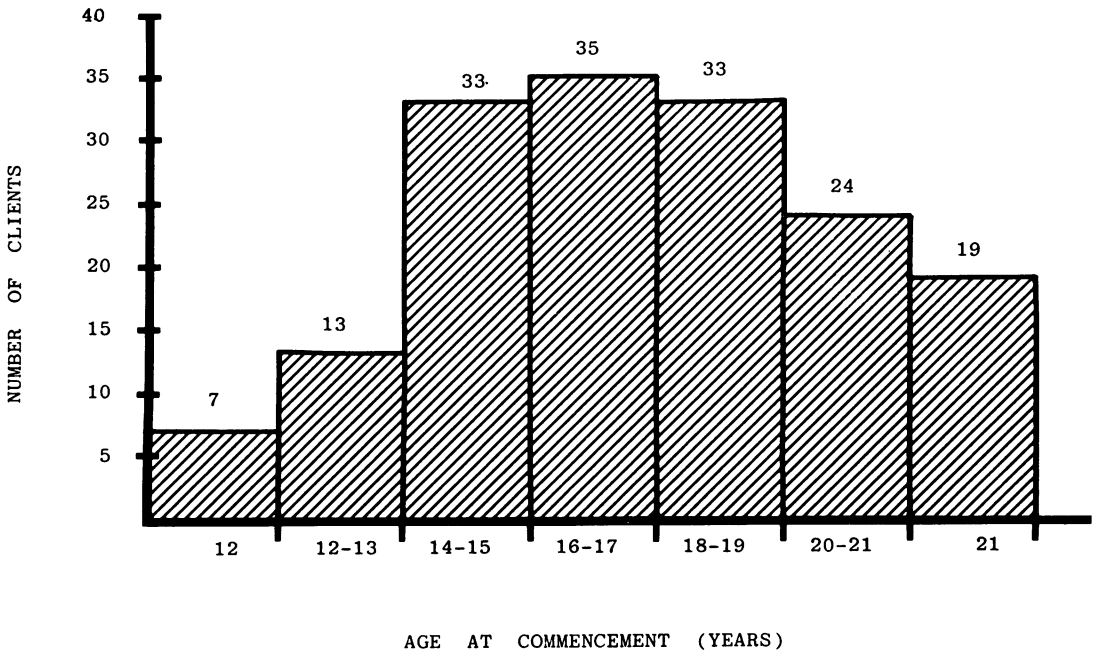
DISCUSSION

Several important facts emerged from this preliminary analysis of the clientele attending the Belfast smoking withdrawal centre, and of the short-term results achieved. First, there exists a large number of people in the community who desire help in stopping smoking. The profile of our clientele was similar to that described by other authors. Like West and his colleagues (1977), our clients began smoking young and smoked heavily. As other authors have found (Williams, 1972), the drop-out rate after the first visit was high, 42 per cent of our clients and 40.7 per cent of Williams' failing to attend further sessions. The actual numbers attending, averaging just over three new clients each week, was close to the optimum, as with the high drop-out rate the actual number in the group was usually in the range 8-16.

The great majority of our clients had not been referred by doctors and their overriding desire was to avoid developing smoking-related diseases rather than to

arrest their progress. This contrasts with the clientele attending clinics such as that of Ball, Kirby and Bogen (1965), who were all referred by doctors and of whom 78 per cent already had developed smoking-related diseases.

The tendency for the habit of regular smoking to develop at around the school-leaving age is demonstrated (Figure). The high mean daily cigarette consumption



of 29.9 is similar to that reported in other studies (Ball, Kirby and Bogen, 1965; West *et al,* 1977). Though the average client's annual expenditure on cigarettes was calculated at approximately £270, it is noteworthy that only 11 per cent regarded the high cost of their habit as being a more important reason for stopping than the health hazard.

The problem of how to analyse the results of a group in which different members attended differing numbers of sessions has been encountered by other workers. Ball and his colleagues (1965) analysed only those who indicated a serious attempt to stop smoking by attending three or more sessions (mean 6) out of the seven in their programme. Orr (1971) excluded those who "lost interest before giving the treatment a chance to be effective". Williams (1972) eventually stopped registering clients who did not return after the first visit. Our short-term success rate of 65 per cent for those attending five or more sessions is similar to the figures of 60 to 88 per cent quoted by Ejrup (1964). The real problem on which attention is being concentrated now is how to persuade those who attend once to keep on attending.

Compared with the important influence exerted by the number of attendances, other factors such as the sex of the clients and the initial daily cigarette consumption had less effect on short-term success rate. A slightly higher success rate in men has also been found by other workers (Williams, 1972; Delarue, 1973; West *et al,* 1977). Our finding that the number of cigarettes smoked formerly did not influence short-term success rate coincides with that of West *et al* (1977). However, these authors found that after five years follow-up there was a higher long-term success rate among formerly light smokers.

The results achieved by the Belfast smoking withdrawal centre in its first year of operation could well be described as disappointing. However, other workers with longer experience have reported that it may take several years for this type of clinic to achieve its full potential (Williams, 1972). We have learned many useful lessons and believe that the effectiveness of the centre in helping people to stop smoking is improving. The second role of the centre is to help those who stop smoking to remain non-smokers. Indeed, some would argue that only the long-term results are really important (Delarue, 1973). We are attempting to follow up clients who have attended the centre, and will report the long-term results later. Only then will it be possible to assess the cost-effectiveness of the centre's work and to advise regarding the setting up of similar centres in other areas.

SUMMARY

The organisation and methods used in Northern Ireland's first medically-supervised smoking withdrawal centre are described. Individual and group counselling, leaflets and films are all employed. In its first year of operation 164 clients sought the centre's help in stopping smoking, 82 per cent because of concern for their health. Their average tobacco consumption was initially 30 cigarettes daily. Women clients outnumbered men but had a lower success rate in stopping smoking. Short-term success in stopping was closely related to the number of sessions attended. Sixty-five per cent of those attending at least five of the six sessions stopped smoking.

ACKNOWLEDGMENTS

We thank the Ulster Cancer Foundation for funding the centre and the Foundation's Director, Mr. Michael Wood, and its Senior Education Officer, Mrs. Wynne Winckles, for their major contribution to setting up and running the centre. We also thank Dr. John Nabney for his invaluable help in counselling and all those who have assisted in running the centre.

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HYPOCALCAEMIA AND SECONDARY HYPERPARATHYROIDISM IN INSTITUTIONALISED MENTALLY-RETARDED PATIENTS RECEIVING ANTICONVULSANT DRUGS: A SURVEY OF 292 PATIENTS

by

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ATTENTION has been drawn to the possible adverse effects of anticonvulsant drugs on bone metabolism by a number of reports in recent years (Dent *et al,* 1970; Richens and Rowe, 1970; Hunter *et al,* 1971; Lifshitz and Maclaren, 1973; Stamp, 1974; British Medical Journal, 1976). The aim of the present study was to investigate this potentially serious side-effect of anticonvulsant therapy in the setting of Muckamore Abbey, a mental subnormality hospital in Northern Ireland.

POPULATION ON ANTICONVULSANT THERAPY

The hospital population consists of 850 patients of all grades of subnormality and of all ages, many of whom have been institutionalised for prolonged periods. They are housed in 20 villas according to age, sex, severity of retardation and presence of physical handicaps. An initial survey of the whole hospital revealed 316 patients on long-term (six months or more) anticonvulsant therapy. The present study comprised 292 (92 per cent) of these patients from whom it was possible to obtain a blood specimen. This was a therapeutic investigation of patients receiving usual hospital therapy who might be at risk from a recognised side-effects of the drug (Hahn, Hendin *et al,* 1972). Nevertheless, there were some patients among the total of 316 who refused to have the venepuncture and these were not assessed further.

There were 149 males and 143 females ranging in age from 3 to 81 years. The group included mentally subnormal patients suffering from a variety of associated and coincidental physical conditions, but excluding known disorders affecting bone metabolism. Nine patients were not suffering from any physical handicap. As would be expected with a group of patients receiving anticonvulsants, the majority were epileptic; 18 (6 per cent) were being treated with drugs such as sulthiame (Ospolot) and carbamazepine (Tegretol) to control behavioural problems. Over half had had at least one fit during the preceding year. Two hundred and twenty-six (77 per cent) had been on continuous anticonvulsant therapy for over five years and took a wide range of other drugs. All were Caucasian and domiciled in Northern Ireland. They were being offered an adequate diet but were not routinely given vitamin supplements. The amount of exposure to direct sunlight was dependent on the patient's degree of mobility. The majority were ambulant and able to get outside in fine weather, but a few of the most severely handicapped were confined to their villas.

Initial survey

Between October 1976 and January 1977, venous blood samples were obtained from the 292 patients, venous compression being used if necessary. The concentrations of calcium, phosphate and alkaline phosphatase in the serum were determined as follows: calcium and phosphate were measured on the Gilford 3500 analyser, using the methyl-thymol-blue method for calcium, and molybdate with reducing reagents for phosphate; alkaline phosphatase was measured in the Vickers D300 apparatus, with phenolphthalein monophosphate. The "usual hospital range" in a general hospital population using these techniques is: calcium 2.20 to 2.65 mmol/1; phosphate 0.8 to 1.5 mmol/1; and alkaline phosphatase 21 to 91 U/1 (Belfast City Hospital Clinical Chemistry Department). The serum alkaline phosphatase level is more age-dependent than either the calcium or phosphate. The upper limit of normal values in health can extend to 200 U/1 in childhood, whereas it should not exceed 91 U/1 in adults. As the age distribution of the present study is wide, the data is presented as a frequency distribution for the actual population rather than applying correction factors for age or other possible variables. The laboratory upper limit for a usual value in health for serum alkaline phosphatase is thus expressed as a range of 91-200 U/1 (Fig. 1).

A further blood sample was obtained (second survey) from 105 of the 133 patients in whom results of the first sample were abnormal. The two results for each individual who had a second test were averaged. There were 10 of these patients whose average calcium was less than 2.0 mmol/1. These 10 had further plasma samples analysed for 25-hydroxycholecalciferol and parathormone levels. Plasma 25-hydroxycholecalciferol and parathormone determinations were carried out by the Supraregional Endocrine Assay Service, using standard radioimmunoassay techniques.

Radiographic survey

Fifty-nine of the 113 patients with calcium values of less than 2.2 mmol/1, phosphate less than 0.8 mmol/1 or alkaline phosphatase greater than 200 U/1, had radiographs of wrists and forearms. This was standardised as far as possible and most patients were exposed to 45 kv and 80 ma for 0.16 seconds. A few patients had less or more according to their build. Assessment of the radiographs was carried out by one of us (EMMcI) without knowledge of the clinical or biochemical findings. A subjective classification into normal, osteoporotic and osteomalacic was made and the transmitted light value measured.

Pharmacological survey

A "drug score" was calculated for each patient, using the technique of Richens and Rowe (1970). This derives a numerical score for the total daily dose of certain anticonvulsant drugs. A dose of 50 mg phenytoin or 30 mg phenobarbitone scored 1 unit and 250 mg primidone scored 1.5 units. A total daily score for each patient was calculated.

Control studies

Thirty-two patients were examined. These consisted of two or three patients from each ward in the same hospital who had been receiving no drug therapy for at least 3 months. Blood samples were obtained in the same way and serum concentrations of calcium, phosphate and alkaline phosphatase were measured.

RESULTS

Initial survey

The distribution of serum calcium, phosphate and alkaline phosphatase in the 292 patients is shown in Figs. 1, 2 and 3. The mean serum calcium was 2.26 (standard deviation 0.09) mmol/1, mean serum phosphate 1.09 (S.D. 0.31) mmol/1 and the mean serum alkaline phosphatase 91.8 (S.D. 61.0 U/1). By comparison with the usual hospital range it is clear that there is a shift to the left of the serum calcium values for the patients taking anticonvulsant drugs; 60 (21 per cent) were below 2.20 mmol/1 and none were above the upper limit. For serum phosphate 17 (6 per cent) were below 0.8 mmol/1 and for alkaline phosphatase 14 (5 per cent) were above 200 U/1.

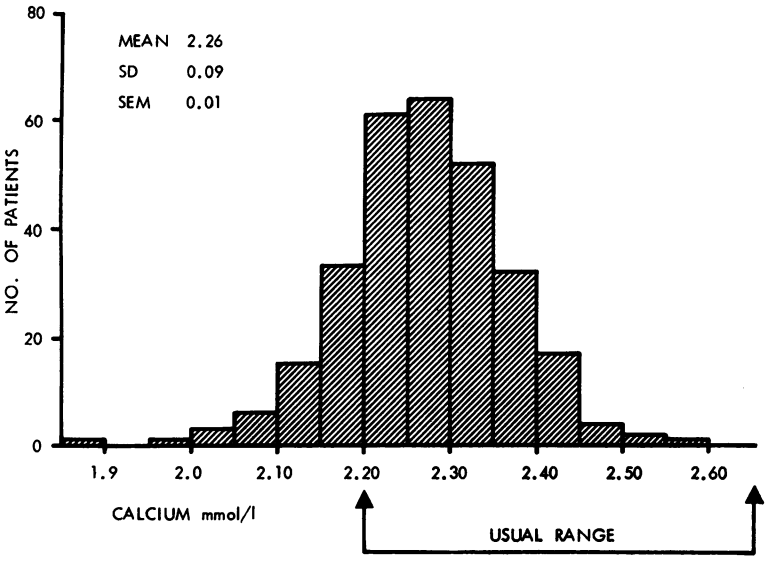

FIG. 1: *Frequency distributions of serum calcium (mmol/1) in the 292 patients receiving long-term anticonvulsant therapy (initial survey).*

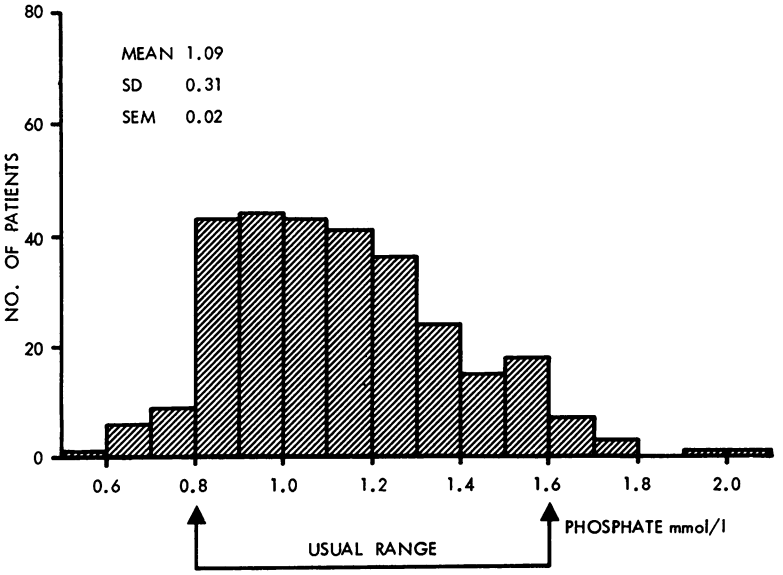

FIG. 2: *Frequency distributions of serum phosphate (mmol/l) in the 292 patients receiving long-term anticonvulsant therapy (initial survey).*

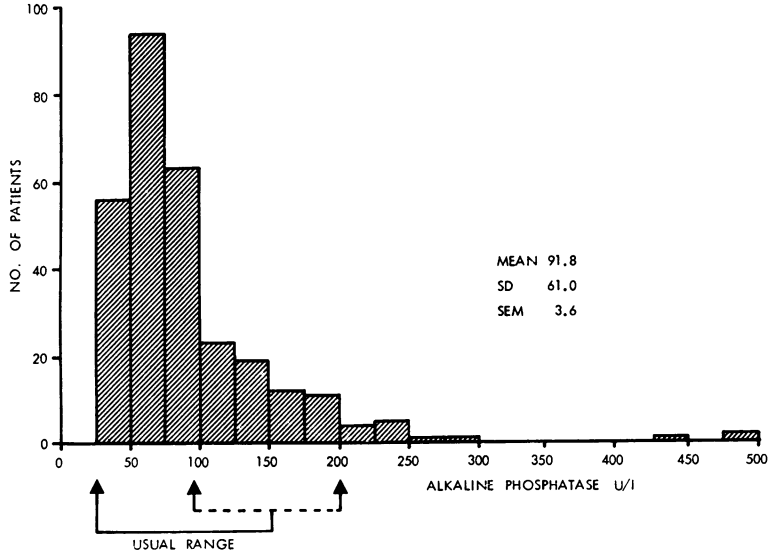

FIG. 3: *Frequency distributions of alkaline phosphatase (U/l) in the 292 patients receiving long-term anticonvulsant therapy (initial survey).*

The 32 control patients all had serum calcium within the quoted "usual hospital range" of 2.20 to 2.65 mmol/1; four control patients had a serum phosphate below and two above the usual hospital range of 0.8 to 1.6 mmol/1; none had an alkaline phosphatase above 200 U/1.

The relationship between serum calcium and phosphate in the 292 patients is shown in Fig. 4 (r=0.10). Six patients (2 per cent) had low values of both calcium and phosphate, but none of these had an alkaline phosphatase above 90 U/1.

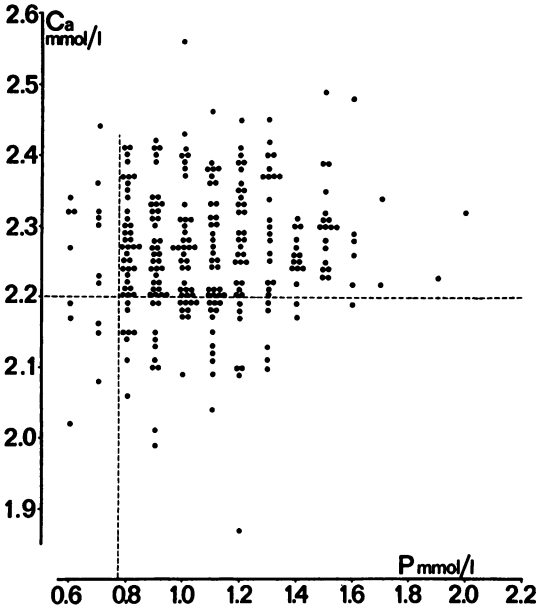

FIG. 4: *The relation between serum calcium and phosphate in the 292 patients receiving long-term anticonvulsant therapy (r=0.1). Six patients had values for* both *calcium and phosphate below the usual hospital ranges (dotted lines).*

Radiographic survey

Thirty-six of the radiographs were subjectively assessed as normal, fifteen as osteoporotic and eight as osteomalacic. Table 1 shows the biochemical and transmitted light values in these three groups. There was a tendency for those judged osteoporotic to be older and those judgd osteomalacic to be younger than the usual group. The mean transmitted light value was lowest for the osteoporotic group and intermediate for the osteomalacic group, confirming the subjective diagnosis. There was no difference in the mean blood calcium values. The blood phosphate was lowest in the osteoporotic group and the alkaline phosphatase highest in the osteomalacic group (although these were considerably younger).

TABLE 1: RADIOLOGICAL SURVEY—59 PATIENTS
(Values are means ± standard errors of the mean)

Subjective Radiological Diagnosis	*No.*	*Mean Age*	*Transmitted Light Value (arbitrary units)*	*Calcium mmol/l*	*Phosphate mmol/l*	*Alkaline Phosphatase U/l*
Normal	36	29	6.70 ±0.14	2.19 ±0.02	1.04 ±0.05	99 ±11
Osteoporosis	15	51	5.80 ±0.18	2.14 ±0.03	0.87 ±0.05	93 ±10
Osteomalacia	8	16	6.20 ±0.40	2.14 ±0.05	1.19 ±0.10	315 ±45

Pharmacological survey

The drug score (for the day on which the blood sample was obtained) for the 292 patients in the initial survey is shown in relation to the serum calcium in Fig. 5. The correlation coefficient r was —0.25, and there was a general trend for those patients with the lowest calcium values to have a higher drug score.

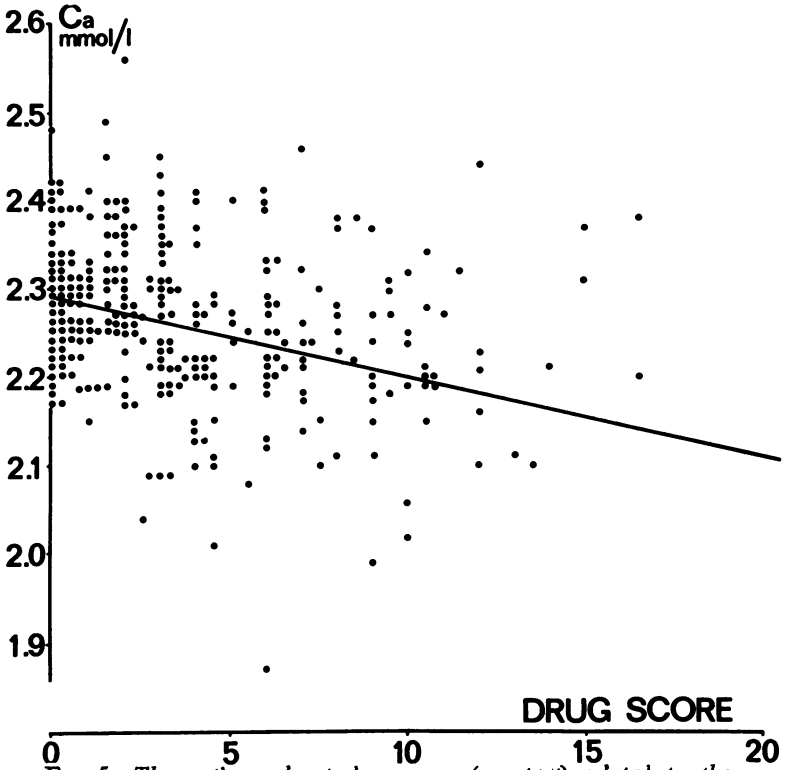

FIG. 5: *The anticonvulsant drug score (see text) related to the serum calcium value on the same day in the 292 patients receiving long-term anticonvulsant therapy (r = —0.25).*

Table 2 shows the frequency of hypocalcaemia in patients receiving the three most commonly administered anticonvulsant drugs (phenobarbitone, phenytoin or primidone). The greatest incidence of hypocalcaemia was found in patients taking primidone with or without other drugs (Table 2). However, most of the patients were on more than one of these drugs, so these data do not necessarily allow individual comparison of the effect of one or other drug alone. When two or three of these drugs were taken in combination, 82 patients (32 per cent) had a low serum calcium; when only one drug was taken, 142 patients (21 per cent) had a low serum calcium. For the 68 patients who received none of these three drugs, only four (6 per cent) had a low serum calcium.

TABLE 2: RELATION BETWEEN SERUM CALCIUM AND INDIVIDUAL ANTICONVULSANT DRUGS

(Many patients were receiving more than one drug concurrently)

Drug	*Patients*	*Patients with serum calcium* <2.20*mmol/l*	*Mean serum calcium mmol/l*	*Mean daily dose mg*
Phenobarbitone	141	31 (22%)	2.29	95
Phenytoin	120	36 (30%)	2.25	205
Primidone	60	22 (37%)	2.23	640

Parathormone and 25-Hydroxycholecalciferol data

Data for a third blood sample on ten patients found after the second survey with mean serum calcium below 2.0mmol/l are shown in Table 3. The serum calcium was still below 2.1mmol/l in all of the patients. Serum parathormone values were elevated above the upper limit or normal (0.73microg/l) in 3 and serum 25-hydroxycholecalciferol values were well below the normal range (3.5 to 30microg/l) in all of these patients.

TABLE 3: SERUM VALUES FOR A THIRD BLOOD SPECIMEN IN SEVERELY HYPOCALCAEMIC PATIENTS

Patient	*Age*	*Sex*	*Calcium mmol/l*	*Phosphate mmol/l*	*Alkaline Phosphatase U/l*	*25-Hydroxy Cholecalciferol microg/l*	*Parathormone microg/l*	*Drug Score*
AS	14	F	2.09	1.20	187	1.1	0.35	3.0
JMcC	14	F	2.01	0.90	480	1.9	1.20	4.5
BMcG	15	F	2.06	0.80	430	0.8	1.20	10.0
BM	16	M	2.09	1.10	476	0.8	0.66	3.0
MM	19	F	2.04	1.10	289	1.4	0.96	2.3
JF	30	M	2.09	1.00	39	2.6	0.20	3.0
EMcC	36	F	1.97	1.20	104	0.8	0.44	6.0
WMcC	46	M	1.99	0.90	87	0.8	0.34	9.0
TH	46	F	2.08	0.70	90	0.8	0.29	5.5
CG	81	F	2.02	0.60	90	0.8	0.44	6.6
Mean	32		2.03	0.95	176	1.2	0.62	6.3
SEM	±8		±0.07	±0.07	±56	±0.2	±0.12	±0.8

DISCUSSION

Mechanism by which anticonvulsant drugs alter calcium metabolism

During chronic therapy with certain drugs a gradual decline in the plasma level of the drug may be observed. This results from the ability of some compounds to stimulate their own metabolism by inducing an increased production of liver microsomal enzymes. There are various enzyme systems in the liver and some have an effect, not only on the drugs which induce them, but also on normal body constituents such as the steroid hormones (Kuntzman, 1969). Cholecalciferol (Vitamin D_3) is chemically similar in structure to certain steroids and there is strong evidence that the increased incidence of osteomalacia observed in patients on anticonvulsant therapy may be the result of an accelerated conversion of cholecalciferol and its active metabolite 25-hydroxycholecalciferol to inactive metabolites by drug-induced liver microsomal enzymes (Hahn, Birge *et al,* 1972).

Significance of biochemical findings

The findings in this study are consistent with those of other studies as regards the prevalence of low serum calcium and raised alkaline phosphatase. Richens and Rowe (1970) studied 160 patients aged 16-70 years in an epileptic centre and found a subnormal calcium in 22.5 per cent and raised alkaline phosphatase activity in 29 per cent. Hunter *et al* (1971) studied 105 children in a residential school and found low calcium in 30 per cent and raised alkaline phosphatase activity in 24 per cent. The other authors did not examine serum phosphate (and this was below 0.8mmol/l in only 6 per cent of patients in the present study).

Albright and Reifenstein (1948) graded osteomalacia into four stages. Thus, about 20 per cent of the Muckamore Abbey population on anticonvulsant drugs could be said to have at least biochemical rickets (Stage I, with persistently low calcium and/or phosphate and normal alkaline phosphatase and Stage II, with elevated alkaline phosphatase). Of these, eight patients (1.6 per cent) had unequivocal radiological changes (Stage III). There were no patients with the overt full clinical syndrome (Stage IV, with myopathy, painful bones and skeletal deformities).

Hypocalcaemia, if not compensated by secondary hyperparathyroidism, may lead to tetany, which can progress to convulsions and eventually to intellectual deterioration and dementia. These features in a mentally subnormal epileptic population might not arouse clinical interest and could be overlooked. This would be the more so because mentally subnormal (or mentally ill) patients may not complain of early symptoms. Vague bone pains, one of the most characteristic features of osteomalacia, might easily be labelled "neurotic" and obscure the correct diagnosis. Stamp (1974) has reported cases in which a vicious circle was set up, epilepsy treated with anticonvulsants producing hypocalcaemia, leading to an increased frequency of fits, leading to an increase in anticonvulsant therapy, in turn aggravating the hypocalcaemia. Secondary hyperparathyroidism in response to chronic hypocalcaemia would be expected to protect these patients from tetany at the expense of further skeletal decalcification.

The fact that hypocalcaemia in patients on anticonvulsant therapy is associated ated with low serum 25-hydroxycholecalciferol is now well established (Hahn, Hendin *et al,* 1972; Stamp *et al,* 1972). This is supported by the consistently low levels found in the ten hypoglycaemic patients in this study. The response of the parathyroid glands to drug-induced osteomalacia has also been the subject of investigation (Greenlaw *et al,* 1972) and the raised parathormone level in three of the ten hypocalcaemic patients shows that secondary hyperparathyroidism has occurred; why this is not so in all the cases is not clear.

Radiological assessment

The radiographic survey did not suggest that the techniques for identifying demineralisation were sensitive enough to be used for routine screening of patients at possible risk, although it was helpful in diagnosis when the biochemical results were suggestive. Whether long-term radiological follow-up of those patients with decalcified bones would be justified is also doubtful, and it is probable that simple biochemical measurements will be sufficient for this purpose. All methods of measurement of bone density by X-rays other than by microradiography or computerised axial tomography (E.M.I. scans) are suspect. Even sophisticated methods involving cortico/medullary ratios, or water-bath radiography using aluminium or calcium hydroxyapatite step wedges have been shown to be erroneous. It is also relevant that osteoporosis and osteomalacia can affect the axial skeleton markedly with little subjective or objective change in the peripheral bones and therefore the hand and wrist is not an ideal area to study.

The prevalence of biochemical and radiographic osteomalacia in this mentally-retarded institutionalised population of all ages points to the need for administration of Vitamin D supplements (Hunter *et al,* 1971; Hahn, Hendin *et al,* 1972; Maclaren and Lifshitz, 1973). There is still uncertainty as to the correct therapeutic dose of Vitamin D (or one of its more active metabolites) in this situation, for there is evidence of considerable resistance to the usual preparation of cholecalciferol (Vitamin D_3) and of rapid biochemical improvement with small doses of 25-hydroxycholecalciferol. As this latter preparation or the close derivative 1-alpha hydroxycholecalciferol is now available for clinical use, it would seem important to study the effect of routine supplementation with a small dose of one of these substances in a population at risk.

SUMMARY

A biochemical and radiographic survey of 292 patients who were receiving long-term anticonvulsant therapy at the Muckamore Abbey Hospital has been carried out. Twenty-one per cent of these patients had biochemical hypocalcaemia. Only six patients had both serum calcium less than 2.20mmol/1 and phosphate less than 0.8mmol/1.

Radiographs of the forearms and wrists were less sensitive in demonstrating minor abnormalities. Fifteen were assessed as osteoporotic and eight as osteomalacic. There was a greater prevalence of hypocalcaemia with primidone than with phenytoin or phenobarbitone and combinations of these drugs had an addi-

tive effect. Among the ten most severely hypocalcaemic patients, all had very low values of 25-hydroxycholecalciferol and three had clear evidence of secondary hyperparathyroidism.

This study supports others that there is a definite risk of chronic decalcifying bone disease among instutionalised patients on long-term anticonvulsant therapy. None of these patients showed any overt clinical sign usually associated with chronic bone disease.

ACKNOWLEDGMENTS

E.M. would like to thank Dr. B. Scally, Dr. J. Calvert and Dr. P. Darragh, Consultants at Muckamore Abbey Hospital, for allowing her to investigate patients under their care; Dr. D. T. Glass, who supervised the radiological survey; Dr. G. Welshman and the staff of the Belfast City Hospital Clinical Chemistry Department; and the nurses and radiographers for the parts they played in this study. We are grateful to Mrs. Bridget Briggs and to Mrs. Jean McCrory for typing the manuscript.

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PREDICTION OF RESPONSE TO BROMOCRIPTINE IN ACROMEGALY

by

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BROMOCRIPTINE was first used in the treatment of acromegaly in 1974 (Liuzzi *et al,* 1974 a). Not all patients show lowered human growth hormone in response to the drug (Liuzzi *et al,* 1974 a; Thorner and Besser, 1975; Sachdev *et al,* 1975). We have performed a series of tests on acromegalic patients in an attempt to discover if any test could predict those patients likely to show long-term response to the drug.

MATERIAL AND METHODS

Eleven active acromegalics, eight with normal adrenal and thyroid status and three on adequate replacement therapy, were studied. Three patients had had no previous treatment. Three had undergone external pituitary irradiation, three had had courses of chlorpromazine, one transfrontal hypophysectomy and another transfrontal hypophysectomy followed by yttrium-90 implantation.

Each patient had a 50g oral glucose tolerance test (OGTT), a 30g arginine infusion, and also an intravenous insulin tolerance test (0.3U/Kg) if the patient had a normal pituitary-adrenal axis. All tests were performed between 9.00 and 11.00 a.m. Human growth hormone, hGH (except during arginine infusion), glucose, insulin, secretin and glucagon were measured during each test by standard radioimmunoassay techniques. Insulin-induced hypoglycaemia was considered adequate if blood sugar fell to less than 50 per cent of the original value, and/or there was a sharp rise in plasma cortisol.

Human growth hormone was measured hourly for 4 hours after a 2.5mg oral dose of bromocriptine. Long-term treatment with bromocriptine was then commenced and dosage increased gradually on the basis of random hGH estimations. Dosages from 5 to 20mg daily were used. After three months the tests were repeated.

RESULTS

Ten of the 11 patients reported subjective improvement varying from improved wellbeing to increased muscle strength and diminished sweating. Five patients experienced side effects. These were exacerbations of pre-existing Raynaud's phenomenon (two patients) and nausea, epigastric discomfort and vasovagal attack each occurring in one patient. In all cases side effects were mild, not necessitating drug withdrawal.

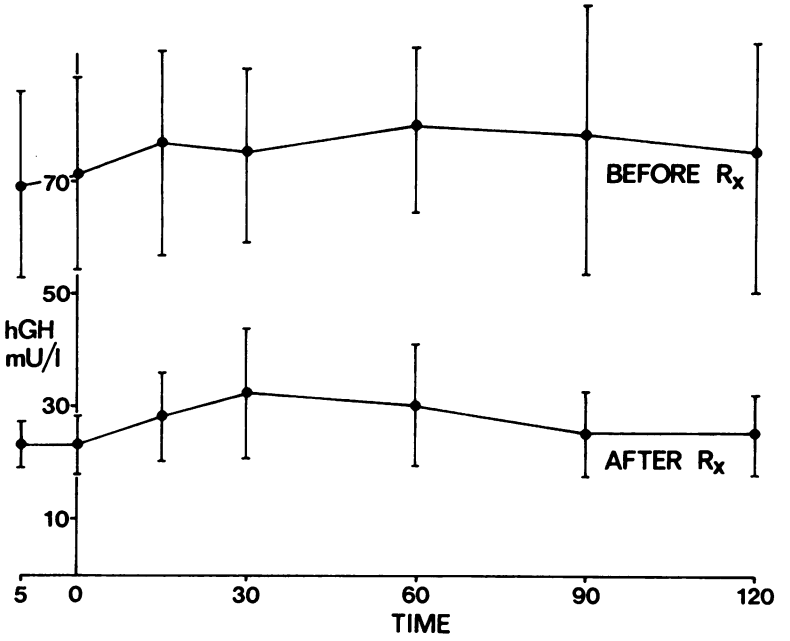

FIG. 1: *Human growth hormone response during 50g oral glucose tolerance test before and after bromocriptine therapy (mean±S.E.).*

Bromocriptine resulted in a marked fall in hGH levels during an oral GTT (Fig. 1). Mean fasting levels fell (69.5mU/1 to 23.2mU/1) as did the levels at 60 and 90 minutes (75.4 and 80.8 to 32.6 and 29.8 respectively). These results were statistically significant ($P \leqslant 0.05$). Individual analysis showed that some patients responded biochemically as measured by mean hGH during the second OGTT while others failed to do so (Table 1). Biochemical response was defined as a fall in mean plasma hGH during the second OGTT to less than 25 per cent of the mean value during the first OGTT. This response showed no correlation with sella size, length of history, previous mode of therapy or pattern of glucose response to arginine infusion.

Fig. 2 shows pattern of hGH response to the first glucose load. We considered whether those patients who suppressed partially during an OGTT might eventually be either responders or non-responders. This was not so. Likewise, a paradoxical rise in hGH during the oral GTT did not delineate response or non-response.

Fig. 3 shows the results following a 2.5mg test dosage of bromocriptine. In five of seven patients the response to this was accurate as a prediction of eventual response. In two cases, one a responder and another a non-responder, the test was unhelpful. However, the test may still be of use (see below).

TABLE 1: MEAN hGH (mU/l) DURING 50g GTT BEFORE AND AFTER TREATMENT

Patient	*Before Therapy*	*After Therapy*	$\frac{\textit{After Therapy}}{\textit{Before Therapy}} \times 100$	*Category*
M.B.	170	11	6.5	R
J.O'N.	49	8	16.0	R
J.O'H.	46	63	137.0	NR
G.R.	126	18	14.0	R
A.S.	40	26	65.0	D
S.S.	69	79	115.0	NR
C.M.	24	16	75.0	D
S.A.	159	6	4.0	R
M.M.	46	11	24.0	R
B.H.	26	25	96.0	NR
A.F.	120	134*	112.0	NR

R: Responder. D: Doubtful.

NR: Non-responder. * Mean outpatient values at review.

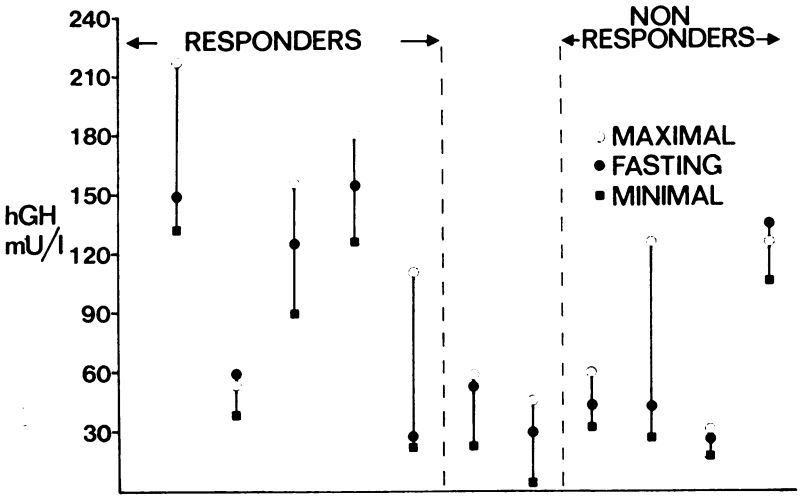

FIG. 2: *Fasting, maximal and minimal human growth hormone values during first 50g oral glucose tolerance test in eventual biochemical responders and non-responders.*

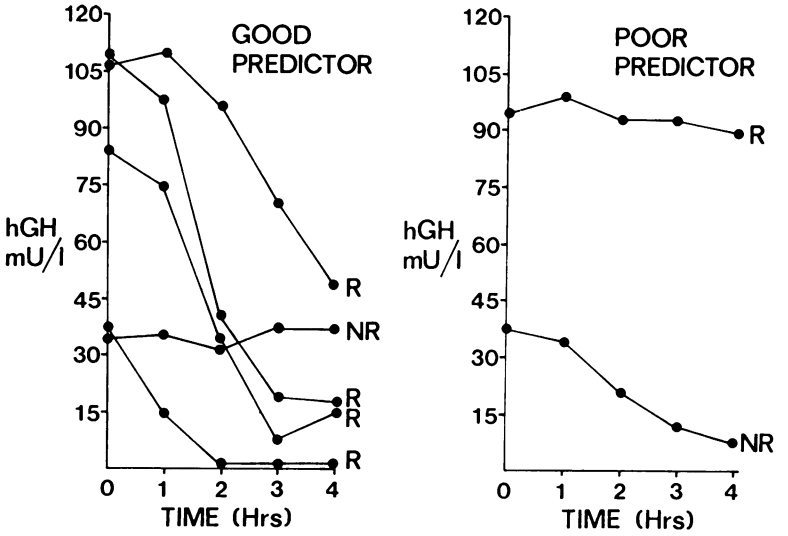

FIG. 3: *Human growth hormone response to a 2.5mg trial dosage of bromocriptine showing correlation with eventual biochemical response to long-term therapy with the drug.*
R: eventual responders - NR: eventual non-responders.

Table 2 shows hGH response to insulin-induced hypoglycaemia. This was of predictive value. Eventual responders showed a much more marked rise in hGH than non-responders whose hGH level remained flat during the test. Is our small group of patients it was uniformly predictive of eventual response to bromocriptine.

Our results also showed that in acromegalics mean glucagon-89, glucagon-57 and secretin were all within the normal range during both OGTTs (Table 3). When biochemical responders and non-responders were analysed separately for each glucose tolerance test, there was no variation so that neither bromocriptine nor falling hGH affect circulating levels of these hormones. In responders there was a fall in peak insulin during the second OGTT from 102 to 52uU/ml, probably on the basis of a lower plasma glucose.

TABLE 2: hGH LEVELS DURING INSULIN-INDUCED HYPOGLYCAEMIA

Patient	*hGH Fasting*	*hGH Maximal Fasting*	*Maximal Value* x 100 / *Fasting Value*	*Category*
M.B.	133	220	165	R
G.R.	100	176	176	R
S.A.	223	280	125	R
M.M.	14	220	1571	R
J.O'H.	31	34	109	NR
B.H.	38	40	105	NR
A.F.	142	146	103	NR

R: Responder. NR: Non-responder.

TABLE 3: MEAN FASTING G.I. HORMONES BEFORE AND AFTER THERAPY

	Before	*After*
Glucagon-89	66.2 pg/ml	54.2 pg/ml
Glucagon-57	118.5 pg/ml	108.5 pg/ml
Secretin	15.2 pg/ml	12.7 pg/ml
Insulin	11.4 uU/ml	10.1 uU/ml

DISCUSSION

Wass *et al* (1977) reported that 21 per cent of a group of acromegalic patients did not respond to bromocriptine. Sachev *et al* (1975) similarly reported two of 21 cases who showed no response. They also stated that the optimum therapeutic daily dose was 20mg or less and that no further significant fall was seen in most of those given higher dosage. Since bromocriptine is an expensive drug, we have looked for possible means of predicting likely response to the drug in reasonable dosage (less than 20mg daily).

Our results have shown that in seven cases out of seven the response to insulin-induced hypoglycaemia was predictive. Patients who showed a marked response in terms of rise in hGH became long-term responders, while those whose hGH remained flat failed to do so. In another series (Liuzzi *et al,* 1974 b) response of hGH to a test dosage of 2.5mg bromocriptine was compared with various tests, including hypoglycaemia, but no uniform correlation was found. In that series only a single dose of bromocriptine was assessed and an hGH "response" to hypoglycaemia was accepted only when the hGH level doubled. Although our results show 100 per cent uniformity, this might well not be so in a larger series.

The bromocriptine test dosage may also be helpful in the long term; in our series, five of seven were accurate predictors, while two were not. This test may not be uniformly reliable or it may be that the two misleading cases were fortuitous. The eventual non-responder was still on a relatively small dose while the other patient may not have been compliant in drug taking.

The question of using predictive tests before starting bromocriptine is unresolved. It may be that all patients on the drug show changes in ratios of molecular sizes of growth hormone (Besser *et al,* 1976) or in somatomedin concentrations. If this proves to be so, it would be worthwhile to treat all acromegalics who show activity of the disease process. At present it remains our policy to give all patients a trial of bromocriptine in reasonable dosage. We feel that both insulin-induced hypoglycaemia and a 2.5mg oral dosage of the drug are useful in predicting likely long-term response. If both tests suggest non-response, then at present it would appear pointless to proceed to massive dosage of the drug.

SUMMARY

Eleven active acromegalics were studied before and after bromocriptine therapy. Five clearly responded biochemically to the drug (mean hGH during second OGTT less than 25 per cent of value obtained during first test). Four did

not (mean 96-137 per cent of original) while response in two was doubtful (mean 65-75 per cent). Ten of the 11 claimed subjective improvement.

A four-hour profile of hGH following 2.5mg bromocriptine given orally predicted likely response to long-term treatment in five out of seven cases but in two was misleading. hGH response to insulin-induced hypoglycaemia predicted eventual response in all cases studied, a brisk rise (125-1500 per cent of fasting levels) being seen in responders. Non-responders did not show this feature (103-109 per cent).

Insulin-induced hypoglycaemia may be of value in predicting response to bromocriptine though numbers studied are small.

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PRESCRIBING IN NORTHERN IRELAND
STUDY No. 2
SYSTEMATIC ANTI-INFECTIVES

by

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THE public and the medical profession generally regard the "antibiotics", by which they mean the synthetic anti-infectives as well as those produced by micro-organisms, as the most beneficial group of drugs introduced in the last 35 years. Some concern has been expressed from time to time about the ways they are used, especially in hospital and as an additive to animal feed stufis. But on the whole the effects of their use are thought to be beneficial. The mortality rate from some infections has fallen dramatically and the pattern of infectious diseases in the community has changed. If this has been an improvement, then the need to prescribe anti-infectives should dwindle. The following study of prescribing was prompted by the knowledge that the prescribing has not dwindled. It was not expected that the study would explain why the prescribing of anti-infectives is still rising, but it was hoped that the results would stimulate further research into the benefits and dangers.

METHODS

Using the technique described in the preliminary paper (Elmes, Hood and Wade, 1976), the prescribing of anti-infectives by all practitioners has been recorded and analysed. To this has been added information about the purchasing of anti-infectives for hospital use so that the total consumption in Northern Ireland can be compared with that of Finland, Norway and Sweden. The prescribing figures have been available here since 1966 and have been used to assess both the total quantity of prescribing and the changes in quantity and choice of drugs which has occurred during the ten-year period. As in the previous report, the information is given in the form of defined daily doses (DDD) per 1,000 of the population per day. The defined daily doses of the important (frequently prescribed) preparations are given in Table 1. These are adult doses and if the preparation is only used for adults it will give an estimate of the number of patients/1,000 of the population on that preparation. Much antibiotic prescribing is for children when the daily dose is usually less than the adult dose. In this

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TABLE 1: DEFINED DAILY DOSES (DDD) OF FREQUENTLY PRESCRIBED ANTIBACTERIAL PREPARATIONS

Approved Name	*Proprietary Names*	*DDD*
1. TETRACYCLINES		
Demethylchlortetracycline	Ledermycin	0.6g
Oxytetracycline	Imperacin	1g
Tetracycline	Achromycin	1g
	Tetracycline	1g
2. CHLORAMPHENICOL	Chloromycetin	3g
3. AMPICILLINS	Penbritin	2g
	Magnapen	
4. CEPHALOSPORINS	Ceporex	1.5g
	Keflex	
5. CO-TRIMOXATOLE	Bactrim	4 tabl.
	Septrin	4 tabl.
6. PENICILLINS		
Phenoxymethyl penicillin	Crystapan V	
	Distaquaine V	900mgm
	Penicillin V	
	V. Cil K.	
Propicillin	Brocillin	
	Ultrapen	0.45g
7. CLINDAMYCIN	Dalacin C	0.6g
8. LINCOMYCIN	Lincocin	1.5g

instance, the number of daily doses (DDD) per 1,000/day will underestimate the number of patients receiving that treatment. Especially in children, courses of antibiotics are not often completed, the surplus tablets being thrown away, or kept in the bathroom cabinet for a future occasion. This lack of "compliance" by the patient means that the prescribed DDD/1,000/day overestimates the actual consumption. These two errors are intrinsic in the method and are the subject of further investigation.

FINDINGS

The total consumption of systemic antibiotics was 6.6 daily doses per 1,000/day in 1966 and has risen linearly to exactly twice that in ten years (see Fig. 1). During the first five years this increase was due to a parallel increase in the three most popular types of preparation. These were the tetracyclines, which rose from 3 to 4.3 DDD/1,000/day; the oral penicillins (other than ampicillin), from 2.4 to 3.1 DDD/1,000/day; and ampicillin, which rose from 0.8 to 1.8 DDD/1,000/day. However, co-trimoxazole (Bactrim and Septrin) had been introduced during this period and by 1970 0.9 DDD/1,000/day were being prescribed. From 1970 onwards the increase in prescribing of co-trimoxazole and ampicillin continued, but the prescribing of the other penicillins and of the tetracyclines both fell a little. Two preparations of co-trimoxazole had been marketed at the same time as a result of combined research by two drug companies and were known to be

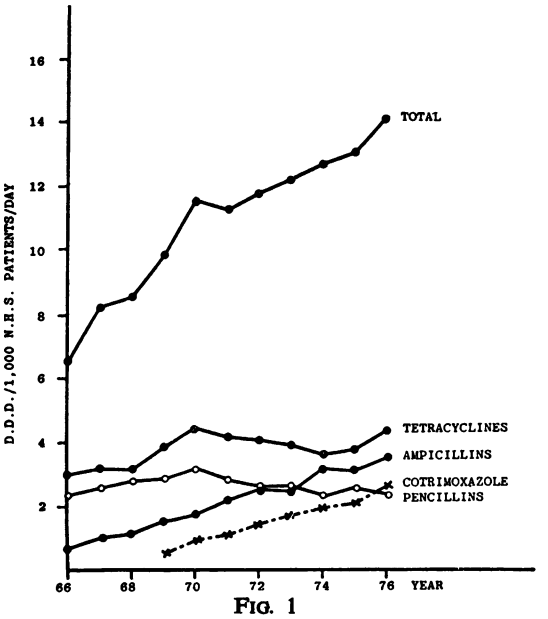

FIG. 1

therapeutically identical. The prescribing of the two has diverged markedly since 1972 (see Fig. 2). As there is no cost difference, some other commercial pressure had led to this divergence.

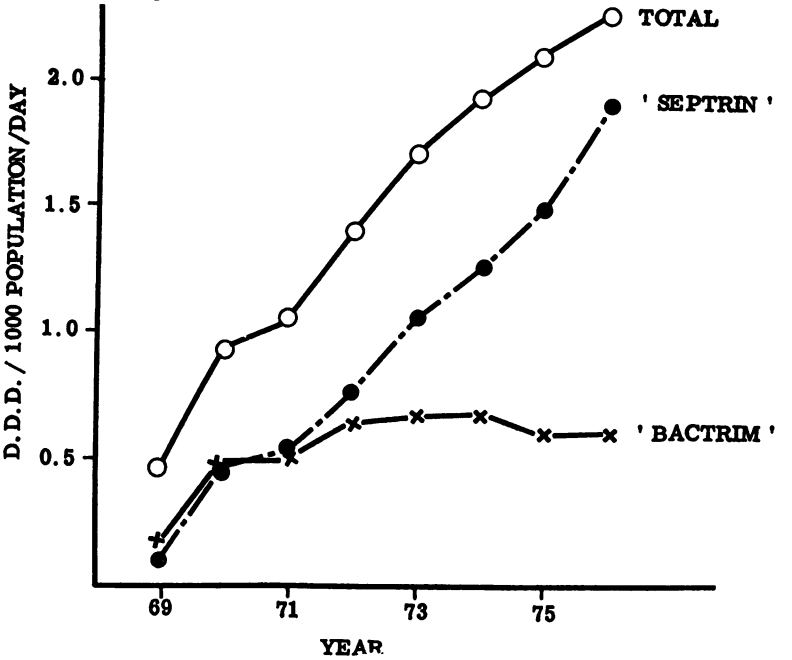

FIG. 2

SEASONAL VARIATIONS

Figure 3 shows a monthly analysis of all the total anti-infective prescribing for 1975. As expected, the peak of prescribing occurred in the winter months of December, January and February, and the trough appeared in the summer months of June, July and August. This pattern was paralleled by each of the sub-groups and is particularly noticeable with the frequently-used preparations.

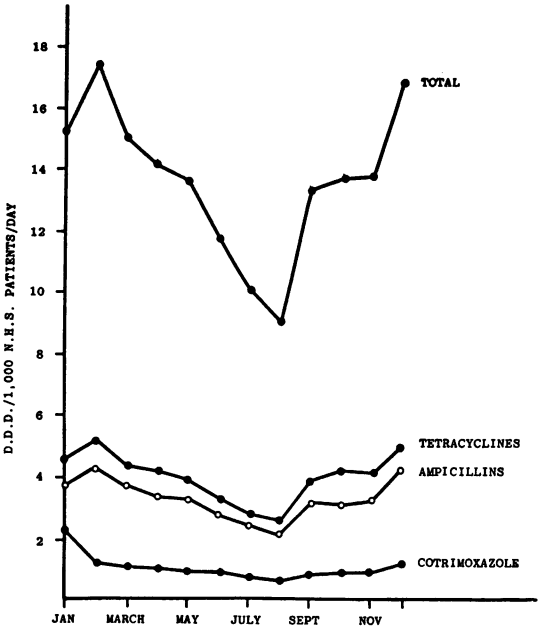

FIG. 3

GEOGRAPHICAL VARIATIONS WITHIN NORTHERN IRELAND

Table 2 compares the prescribing levels for each of the new area boards, dividing the more heavily populated Eastern Board into two (E1, Belfast City;

TABLE 2: THE TOTAL ANTI-INFECTIVE PRESCRIBING RATE FOR EACH AREA BOARD FROM 1974 TO 1976 EXPRESSED AS DDD/1,000 POPULATION/DAY

	1974	-	1975	-	1976
Eastern Board 1	12.76	-	13.57	-	13.87
Eastern Board 2	11.86	-	12.33	-	13.73
Northern Board	12.09	-	12.84	-	13.65
Southern Board	13.47	-	13.94	-	14.61
Western Board	12.27	-	11.73	-	15.56

E2, rest) for the years 1974-5-6. Fig. 4 Shows a map of the distribution for 1976. When such a geographical analysis is carried out for all drugs a higher level of prescribing is found in the densely populated areas (Belfast itself and the rest of the Eastern area). The geographical differences are particularly marked for psychotropic drugs, which are nearly twice as frequently prescribed in the Belfast area as in rural County Londonderry (Elmes, Hood, McMeekin and Wade, 1976). However, for anti-infective drugs the level of prescribing is more uniform, the coefficient of variance being 5 per cent in 1974 and 6 per cent in 1975.

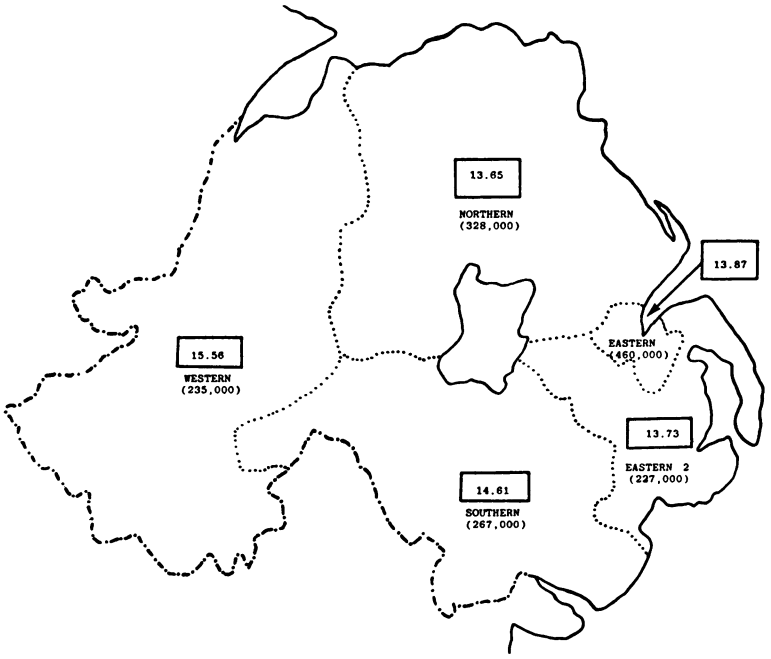

FIG. 4

Prescribing in the Belfast area (Eastern 1) and County Down (Eastern 2) is relatively low in all three years.

On comparing the prescribing of the main antibiotic groups, greater differences between the area boards become apparent (see Fig. 5). For instance, in the Southern Area the prescribing of antibiotics is the same as the average for the Province, except for the high prescribing of co-trimoxazole in the form of Septrin. But statistical analysis indicates that these differences are due to random variation.

GEOGRAPHICAL COMPARISON WITH NORWAY AND SWEDEN

Complete information has not been available for sufficiently long to make reliable comparisons, but the overall trend is for increasing use. Total prescribing is highest for all drugs in Sweden and this also applies to anti-infectives. The

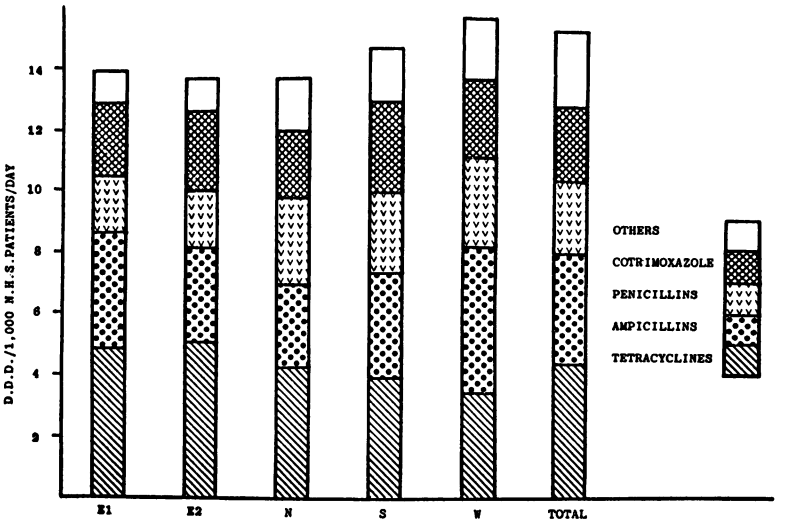

FIG. 5

prescribing there was over 16 DDD/1,000/day in 1975 when in Northern Ireland it was just over 13 DDD/1,000/day and Norway had not reached 10 DDD/1,000/day in 1974. Fig. 6 shows the information available. The ampicillins (Penbritin

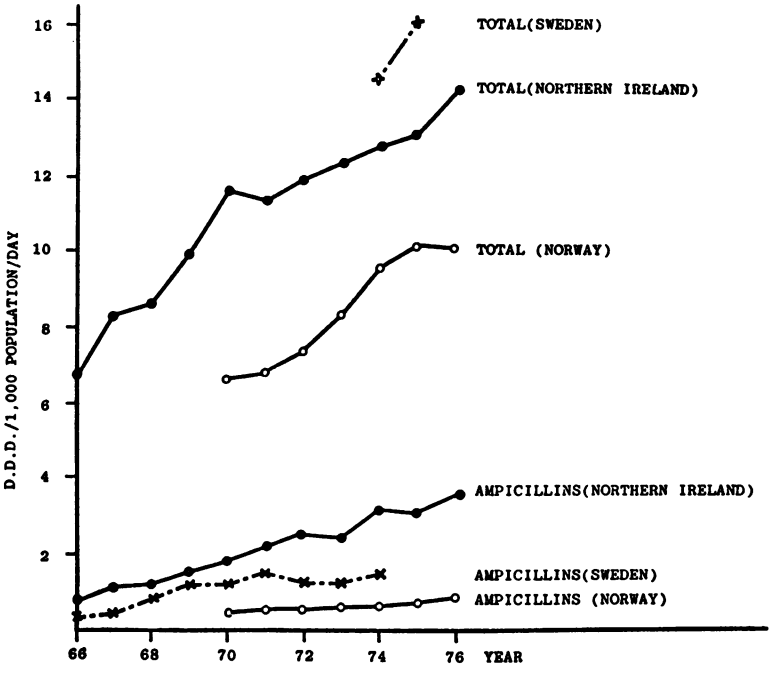

FIG. 6

and Magnapen) have been prescribed increasingly frequently in all three countries but remain relatively unpopular in Scandinavia. These broad spectrum penicillins accounted for 8 per cent and 10 per cent of the antibiotic prescribing in Norway and Sweden respectively at a time when they formed 22 per cent of the antibiotic prescribing in Northern Ireland.

THE PRESCRIBING OF OTHER ANTIBIOTICS IN NORTHERN IRELAND

In 1976 prescribing of the cephalosporins at 0.62/DDD/1,000/day was higher than that of erythromycin (0.50 DDD) for the first time. Up until then erythromycin was the more frequently prescribed of these two which are promoted for treating respiratory and other common infections. The other antibiotics (chloramphenalcol, lincomycin, clindamycin and streptomycin) should only be used in special circumstances.

In tracing the changes in level of prescribing in the last 10 years, it is noticeable that chloramphenicol has fallen from 0.06 to a negligible quantity. Streptomycin has fallen from 0.15 to 0.03. In both cases their use should be limited to the management of relatively uncommon infections.

ROUTE OF ADMINISTRATION

Nearly 80 per cent of anti-infective prescribing is for tablets or capsules. Although liquid oral preparations are available for the very old or very young, they only account for as much as a third of the prescribing in the case of co-trimoxazole.

These figures include hospital prescribing and the stock prescriptions used by general practitioners to replenish their supply of ampoules for immediate use. Even so, antibiotics by injection are a trivial part of the total. Gentamycin (when not in topical preparations) is used entirely by injection, but even in hospitals the total usage is also trivial (Table 3).

TABLE 3: BREAKDOWN OF MAIN PREPARATION ACCORDING TO ROUTE OF ADMINISTRATION 1975

	Tablet or Capsule	*Oral Liquid*	*Injection*
Penicillin	1.45	0.51	0.02
Ampicillin	2.20	0.71	—
Tetracyclines	3.52	0.22	—
Co-Trimoxazole	1.51 (0.14)	0.58 (0.04)	—
Cephalosporins	0.35 (0.01)	0.11	— (0.01)
Erythromycin	0.31	0.28	—
Streptomycin	0.02	0.01	—
Gentamycin	—	—	— (—)
Lincomycin	0.05	0.01	—
	9.56 (79%)	2.47 (20%)	0.03 (1%)

Examples of hospital prescribing are given in brackets and form a trivial part of the whole.
"—" = less than 0.01 DDD/1,000/Day.

The topical use of antibiotics is not included in this analysis as it is the subject of a separate study.

DISCUSSION

This analysis reveals a steady increase in the prescribing of anti-infectives but does not indicate whether this is related to a rise in the incidence of clinical bacterial infections. Analysis of the indications for prescribing would be necessary to establish this. Whether they are administered to treat established bacterial infections or to prevent them, their increasing use can be justified if the morbidity and mortality due to bacterial infections in the community is seen to be reduced.

Such beneficial effects are difficult to measure with existing information. Morbidity (sickness absence) information is recorded but not in sufficient detail. Deaths are recorded in more detail. Deaths from tuberculosis have continued to fall during the past ten years. The bulk of the anti-infective prescribing is for "other infections". Among these are ICD Nos. 030-039, which in Northern Ireland have remained constant between 1968 and 1976. Within this group death due to whooping cough and tetanus (which are prevented by vaccination) have fallen from four each year to nil. In contrast, septicaemia deaths have risen by 30 per cent. Numerically more important in Northern Ireland are deaths from pneumonia (ICD 480-486). These have risen from 687 in 1968 to 804 in 1976. Viral pneumonia has remained constant and there has been a 20 per cent increase in death due to pneumococcal infections as well as to bronchopneumonia.

Antibiotics carry a relatively high risk of adverse reactions and regularly occupy the first few places in national and international reporting systems for adverse reactions. Hospital monitoring studies in Belfast indicated in 1965-66 that the most frequently used antibiotic (ampicillin) produced an adverse reaction in 7.8 per cent of patients (Hurwitz and Wade, 1969). A follow-up in the same hospital in 1975 showed co-trimoxazole to be the most frequently administered preparation and it produced adverse reactions in 3.4 per cent of patients. Side effects in patients treated at home are frequent but minor and they are not a frequent cause of admission to hospital.

There is an indirect side effect of antibiotic usage which has led to restrictions being placed on their addition to animal foodstuffs following the report of the Swann Committee (Swann, 1969). Hospitals have also had to adopt antibiotic policies to control their use. When antibiotics are present in an environment, a change in the bacterial flora occurs with the replacement of sensitive organisms by ones which are resistant. Infections arising in such an environment are increasingly likely to be due to these resistant organisms and to require treatment with newly-introduced antibacterial agents. These changes occur relatively slowly outside hospital, but already the usefulness of benzyl penicillin, ampicillin and tetracyclines and the sulphonamides for the treatment of common infections arising at home has been seriously impaired. Failure to respond to treatment can be regarded as a negative side effect of previous antibiotic use. These considerations do not appear to have influenced the prescribing of antibiotics in Northern Ireland during the last 10 years. If certain infections are now resistant to benzyl penicillin

and ampicillin, you would have expected their use to have diminished rapidly and their replacement by flucloxacillin and co-trimoxazole respectively. Although the prescribing of these last two has risen, that of benzyl penicillin and the related oral penicillins has hardly fallen and the use of the ampicillins continues to increase.

Many of the positive side effects of antibiotic therapy are due to immediate or delayed allergies. Given to a population not previously exposed, the frequency and severity of these effects is low. But as the number of patients given the drug rises, so that likelihood of a sensitised patient receiving a further course of treatment and developing serious allergy or anaphylaxis increases. This is occurring with both penicillins where the situation seems reasonably stable and acceptable, and with co-trimoxazole where the incidence of serious allergy to the sulphonamide component may still be increasing.

SUMMARY

Analysis of the Northern Ireland prescribing, both in hospital and at home, shows the increased use of drugs for bacterial infections. The overall rise of 10 per cent a year is due to an even greater increase in prescribing of popular broad spectrum agents (ampicillin and co-trimoxazole). The prescribing pattern and the increase shows no geographical variation within the Province. Allowing for different initial levels of prescribing, the same pattern of change is seen in Norway and Sweden. These drugs frequently cause adverse reactions. Evidence of benefit is hard to obtain and the death rate from some of the relevant infections has increased.

ACKNOWLEDGMENTS

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RECENT DEVELOPMENT IN HEALTH EDUCATION IN SCHOOLS IN NORTHERN IRELAND

by

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FOR many years teachers in both primary and secondary schools have been making their contribution to the health education of their pupils. In the primary schools this has largely been in the context of the general curriculum and in secondary schools as relevant application of the subject matter in particular subject areas, such as home economics, biology and physical education. Generally this has been done at an individual level, with teachers being given very little guidance and, in most cases, being unaware of what others were doing in this field. In England the Department of Education and Science (DES) published a handbook (1968), and more recently a curriculum paper on health education has been produced in Scotland (Scottish Education Department, 1974). Apart from the circulation to schools of a very occasional document on a specific aspect such as *Drugs and the Schools* about 1972 (DES, undated), the Ministry or Department of Education in Northern Ireland appear to have given no guidance on the matter. Two surveys of the current practice of health education were carried out in English counties—Buckinghamshire (Myatt, 1971) and Staffordshire (Head, 1973), and an enquiry into the factual knowledge of certain aspects of health by students entering teacher training colleges in England was reported in 1972 (Rout and Painter). In Northern Ireland the only contributions to the subject between 1966 and 1974 appear to be an unpublished dissertation on the provision of sex education in schools (Taylor, 1967), a report on health education in the Government training centres in County Antrim (McNarry, 1972), and an article on the place of health studies in the training of graduate teachers (Tracey, 1969).

Since 1974 there has been considerable increase in activity in this field. Panels of interested persons have been formed in Teachers' Centres; the Northern Ireland Schools Curriculum Committee has financed five surveys of aspects of health education and has sponsored trials of newly-prepared curriculum material in schools; in-service courses for teachers have been held and health education has been introduced as a subject in the Northern Ireland Certificate of Secondary Examination (CSE) programme.

In 1975 the Northern Ireland Schools Curriculum Committee funded the conduct of five surveys. Each was carried out by means of a questionnaire. Two of these examined the current practice of health education in primary and in post-primary schools. The other three investigated the attitudes of teachers in post-primary schools, of pupils in their last year of compulsory schooling (i.e., about 16 and over), and of their parents to health education. Summaries were published in its *News Bulletin* (NISCC, 1976) and papers based on the surveys have appeared in journals (McGuffin, 1976; 1977a, b, c).

PRACTICE IN PRIMARY SCHOOLS

The principals of one half of the primary schools in the Province were invited to participate in the inquiry into current practice; 234 (41 per cent) completed the questionnaires. The main emphasis in these schools is on road safety (included in the curriculum of 96.6 per cent of the schools which completed the questionnaire), dental health (87.5 per cent) and personal hygiene (81.9 per cent). With older pupils (aged 9-11 years) about half of the schools deal with safety at home and in the water and with smoking. Facts about menstruation are taught in less than 10 per cent of the schools and about reproduction in less than 15 per cent. In these respects the recommendations made in the Primary Teachers' Guide (DENI, 1974) do not appear to have been followed in many schools. While most of the teaching related to health topics is given by the class teacher within the context of the other school subjects, a few schools allocate a specific period on the time-table for health education with 10-11 year-old pupils. About one-third of the schools make use of the services of the local health education personnel, and in most instances the subjects dealt with are dental health and personal hygiene. In about 70 per cent of the schools concerned the health education officer teaches individual classes and the visit is followed up by the class teacher, while in the remainder of schools classes are amalgamated into larger groups on the occasions of these visits. The health education officers also assist in an advisory capacity and about half of the schools where this service is not currently available claim they would welcome such assistance. From the evidence in the replies it would appear that the present situation in respect of the involvement of HEO, health visitors and school nurses in class-based work is rather haphazard and dependent on the willingness, on the one hand, of the medical staff to contribute in this way, and, on the other, of the schools to make use of the facility. It is clear that in some cases very useful liaison takes place and a very worthwhile contribution is made.

PRACTICE IN SECONDARY SCHOOLS

The questionnaire in this survey were sent to all grammar and secondary schools in the Province. Though only just over one-quarter replied, the sample represented a fair cross-section of the different types of school. There is evidence that many aspects of health are discussed within the context of the general curriculum, especially by teachers in the fields of biology, home economics, religious studies and physical education. This work, however, is in many cases unco-ordinated and the extent to which pupils receive instruction in the various health topics is dependent on their choice of subjects. Health education as a subject in its own right appears on the time-tables of 13 schools, in five of which it is offered as a subject option in forms IV-V (i.e., with 14-16 year-olds). The topics taught to some pupils at some stage in their school career in over 77 per cent of schools include personal hygiene, alcohol, drug misuse, smoking, nutrition, reproduction, home safety and moral education, while, by contrast, childcare, parenthood, contraception, venereal disease, environmental health, road safety and cancer are dealt with in between 50 and 60 per cent of schools.

RECOMMENDATIONS OF THE NORTHER IRELAND SCHOOLS CURRICULUM COMMITTEE

Arising from the surveys, the Northern Ireland Schools Curriculum Committee commended to principals that health education in its widest sense be seen as an essential constituent of all education. Attention was drawn to the desirability of designating a member of staff as responsible for planning and co-ordinating the health education programme. The increased use of the wide variety of aids available was recommended, and the inclusion of an adequate preparation within initial training to enable teachers to make an informed and effective contribution was advocated.

THE ATTITUDES OF TEACHERS, YOUNG PEOPLE AND PARENTS

A sample of 500 teachers representing all major subject areas and drawn from all grammar and secondary schools was asked to participate in the survey of teachers' attitudes; 240 (48 per cent) co-operated. Many of the teachers showed a concern that the major aspects of health education should be included in the curriculum of pupils before the minimum school-leaving age (i.e., 16), with over 90 per cent approving the inclusion of the topics—smoking, personal hygiene, road and water safety, first aid, alcohol, conservation and home safety—and over 50 per cent approving all 25 listed aspects. The only topics which more than 25 per cent of those replying definitely disapproved of being taught were contraception and mental health. In many cases teachers advocated the inclusion of topics in the curriculum, with which they felt unable to assist in the teaching. Less than 15 per cent were prepared to handle venereal disease, contraception, childcare and mental health.

The fifth form pupils in eight schools (five with mainly Protestant pupils and three with mainly Catholic pupils) answered a simple questionnaire, 733 young people taking part. There was a remarkable similarity in the answers of boys and girls and of pupils of different religious affiliation. The topics least often discussed at home or in school and those about which the young people wished to be taught about in school were venereal diseases, contraception and mental health.

Only schools with mostly Protestant pupils agreed to co-operate in the survey of parents' attitudes. In six schools the parents of 496 fifth form pupils were invited to complete a simple questionnaire, parallel in structure to that given to pupils, to which 247 (49.8 per cent) replied. While over 90 per cent talk about hygiene, road safety and smoking, only 37 per cent discuss contraception or venereal disease; but 66 per cent say they would like their young people told about VD in school and 56 per cent took the same attitude towards contraception. While there is relatively little difference in the topics discussed with boys compared with girls, parents do discuss reproduction, VD and contraception to a significantly greater degree with their daughters than with their sons.

HEALTH EDUCATION AS AN EXAMINATION SUBJECT

Since health education was introduced by the Northern Ireland Certificate of Secondary Education Board (NICSE, 1973) in 1975, increasing numbers of pupils in secondary schools have taken the subject, the figure in 1977 being 562 pupils from 39 schools.

ACTIVITIES IN TEACHERS' CENTRES

Panels, including teachers, college of education staff and health education personnel, have been formed in Belfast, Bangor and Omagh. These enable the various interested parties to discuss problems and share expertise to mutual advantage. An in-service course, consisting of nine afternoon sessions, was provided in Belfast during 1975-76, in which the subjects were the much-publicised problems of smoking, alcohol and drugs and the question of 'relationships'.

CURRICULUM AND DEVELOPMENT PROJECTS

The Schools Council, which is responsible for curriculum development and examinations in England and Wales, set up in 1973 the Health Education (5-13) Project. Its brief included the development of teachers' guides for health education of pupils 5-13 and the identification and development of materials to support them (Williams, 1974). For its its detailed work, the project divided the age range to which it was assigned into two, namely 5-8 and 9-13. In dealing with the older age group, eight topic areas were identified and for each, material was prepared for teachers and pupils. The 'units' and their inter-relation are shown in Fig. 1. Eight schools in the Belfast district, five primary and three secondary, were involved in the class trials of this draft material during the Autumn Term 1975. Early the following year an exhibition of pupils' work was mounted in the Teachers' Centres and five teachers spoke about it at an evening meeting. The reactions of some of the teachers to the particular sections of the material were published in the *News Bulletin* (N.SCC, 1976). The topics covered included "Myself", "Deadly Decisions! ", "From Sickness to Health", "'Food for Thought" and "Skills and Spills".

During the summer of 1977 the Project published its materials for teachers of lower primary classes (ages 5-8). The guide produced, *All about me,* deals with the questions "How did I begin?", "What is growing?" and "What helps me grow?" as well as giving guidance on teaching about looking after oneself, keeping safe and knowing about others. The guide for teachers of upper primary and lower secondary age groups, *Think Well,* deals with the topics as set out in Fig. 1.

Following on the work of this project, the Schools Council initiated a further operation to consider health education in the 13-18 age group. This project began active work in the Autumn of 1977 with the aims of investigating the organisation of health education in the secondary school curriculum, preparing teachers' guides and developing materials appropriate to pupils aged 13-18. Six schools in the Province will participate in the trials stages of this project in the 1977-79 period, and for the first time a liaison group based on the Colleges of Education will be closely identified with a schools project.

The Health Education Council also set up a curriculum development project, led by McPhail at Cambridge. Its aims were similar to those of the projects already described, but it concentrated on the way in which boys and girls between the ages of 8 and 16 learn their life-style and health behaviour (McPhail, 1974). It produced four sets of material and supporting teachers' notes. *And how are you feeling today*? is a cartoon-illustrated stimulus approach for use with groups of boys and girls and consists of 42 situations illustrated on work-cards.

A group of 76 illustrations involving choices relevant to health and personal growth are presented on work-cards entitled *Support Group* and are designed to stimulate creative involvement by and between the members of each small group which uses them. Two sets of studies called *Care to Know*? and *Who Cares*? focus on the quality of personal relationships, giving 40 studies of teacher-pupil relationships and 17 studies taken from settings other than school.

HEALTH EDUCATION IN COLLEGES OF EDUCATION

In September 1974 all students entering Stranmillis College were given an objective-question test consisting of 43 items covering factual information on reproduction, genetics and venereal diseases, based on a test used in English colleges by Rout and Painter (1972). The results (McGuffin, 1974) indicated that knowledge in these areas was very limited and much misinformation was evident. This seems to show that in general even able students are leaving secondary education with little effective knowledge of these areas of biology and it can reasonably be concluded that the large majority of pupils have even less knowledge and understanding. The curriculum in Stranmillis College includes two courses which are compulsory for all students, an eight one-hour session course in the first year dealing mainly with approaches to health education in the primary school, and a course of first aid in the third year which is equivalent to the adult certificate of the Ambulance and Red Cross Societies. Students preparing to teach in secondary schools may choose a more extensive course of health education as an option in their second year. Health education is taught by the Physical Education Department in conjunction with the College Medical Officer.

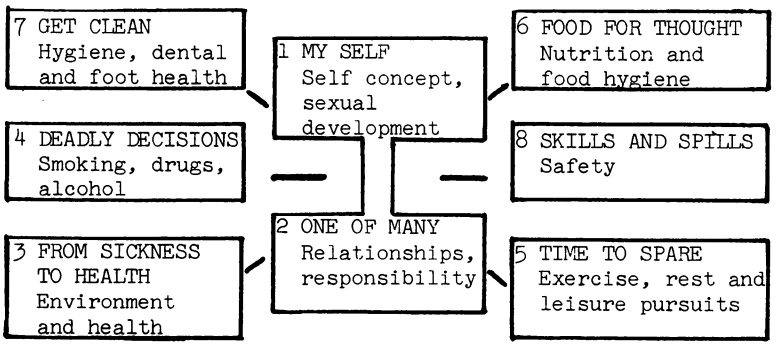
THE HEALTH EDUCATION COUNCIL

Professor W. S. B. Lowry has succeeded Professor J. Pemberton as the Northern Ireland representative on the Health Education Council and he chairs the advisory committee on health education set up in 1976 by the Department of Health and Social Services (Northern Ireland). The Council also funded a research project, based in Stranmillis College, which is currently investigating the extent of health knowledge of 16-year-olds in the Province and how this is related to behaviour in corresponding areas of health. In this a random sample of 2,400 fifth formers (ages 15-16) in secondary and grammar schools answered a 50-item multiple-choice knowledge test and completed a health behaviour questionnaire dealing with nutritional, exercise, smoking and drinking patterns. It is expected that the report on the findings will be submitted to the HEC by March 1978.

CONCLUSION

As the topic of health education has become discussed increasingly in recent years, it is clear that what has been largely regarded as "everyone's business" has, in fact, been "no one's responsibility". Teachers are asking the question, "Is health education a part of the educative process or is it an arm of preventive medicine?" With the introduction into schools of the counselling and guidance scheme, for which selected teachers have been specially trained, it is becoming more clear that a multi-disciplinary, multi-professional approach is required, not only within the school but between the school and the many agencies outside it which contribute to the general health structure of the community. Much remains to be done, and the author believes worthwhile results will be obtained only when the education and medical services, in all their multi-various aspects, co-operate, each understanding and valuing what the others can contribute and making its own individual contribution within a co-ordinated, planned and unified programme.

Figure 1



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A REVIEW OF AETIOLOGICAL FACTORS IN ERYTHEMA MULTIFORME

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THE clinical syndrome of erythema multiforme extends from a mild rash with typical target lesions of the hands and feet to a severe illness with widespread involvement of the skin and mucous membranes as in the Stevens-Johnson syndrome (Stevens and Johnson, 1922). It has been reported to occur in association with a number of different stimuli after an interval of one to three weeks (Champion, 1972; Shelley, 1967). The list of associated factors is large and some are included on the basis of single case reports. There has, however, been no comprehensive survey demonstrating the relative importance of the various aetiological factors involved in erythema multiforme of all degrees of severity in an unselected group of patients. We therefore undertook a retrospective study of all patients newly diagnosed as having erythema multiforme over a three-year period throughout Northern Ireland.

PATIENTS AND METHODS

The hospital records of all dermatology departments throughout Northern Ireland were examined. During the years 1972 to 1974 a total of 184 patients were classified as having erythema multiforme, including those with the Stevens-Johnson syndrome. A questionnaire was sent to 162 patients in whom a confident clinical diagnosis of erythema multiforme had been made. The information obtained from the questionnaires was correlated with the hospital records available for each patient.

RESULTS

Eighty-five (52.5 per cent) out of the 162 questionnaires were returned completed. In analysing the information obtained it became apparent that the conclusions which could be drawn from a single episode of erythema multiforme were limited. Accordingly the patients were subdivided into two groups, those having had more than one attack and those having had a single attack of erythema multiforme.

Patients having had more than one attack of erythema multiforme

The incidence of reported precipitating factors in this group of patients is shown in Table 1. A total of 27 (62.8 per cent) out of 43 patients had herpes

simplex infection in association with erythema multiforme. Other infections were less commonly associated with erythema multiforme in these patients, a single patient having had a sore throat preceding an attack of erythema multiforme on two occasions. Drugs were associated with the rash in two patients, the drugs concerned being trimethoprim-sulphamethoxazole (Septrin) and pentazocine hydrochloride (Fortral). Various other factors such as pregnancy, sunlight and contact dermatitis produced an erythema multiforme type of rash in five patients on two or more occasions. One patient produced the rash in response to a wasp sting on one occasion and later in association with impacted wisdom teeth. In seven (16.3 per cent) out of 43 patients who had more than one attack of erythema multiforme, no obvious precipitating factor was reported.

TABLE 1: REPORTED PRECIPITATING FACTORS IN 85 PATIENTS WITH ERYTHEMA MULTIFORME

Precipitating factors	*Patients with more than one attack (per cent)*	*Patients with one attack only (per cent)*
Herpes simplex infection	27 (62.8)	4 (9.5)
Other infection	1 (2.3)	4 (9.5)
Drugs	2 (4.7)	1 (2.4)
Drugs and infection	0	5 (11.9)
Miscellaneous factors	6 (13.9)	6 (14.3)
No obvious factor	7 (16.3)	22 (52.4)
Number of patients	43	42
Percentage of total	50.6	49.4

Patients having had a single attack of erythema multiforme

The incidence of the various types of precipitating factor in this group of patients is shown in Table 1. Only four (9.5 per cent) patients out of a total of 42 patients who had a single attack of erythema multiforme had associated herpes simplex lesions. In four patients single attacks followed infections other than herpes simplex. These infections were orf, streptococcal throat, measles and smallpox vaccine. In addition, five patients had a single attack of erythema multiforme in association with an infection for which a drug was prescribed as shown in Table 2. However, in these patients it is difficult to know whether the drug, or the infection for which it was prescribed, was the relevant aetiological factor. A drug was the single factor associated with an attack of erythema multiforme in only one patient, the drug being phenylbutazone. Miscellaneous factors, pregnancy in two patients and insect bites in three patients, were associated with a single episode of erythema multiforme, while in one patient the final diagnosis was dermatitis herpetiformis though the initial presentation was that of erythema multiforme. No obvious precipitating factor was found in a total of 22 (52.4 per cent) of this group of patients.

TABLE 2: INFECTION AND CONCURRENT DRUG THERAPY ASSOCIATED WITH A SINGLE ATTACK OF ERYTHEMA MULTIFORME

Infection	*Drug*
Sinusitis	Clindamycin
Diarrhoea	Trimethoprim-sulphmethoxazole
Throat infection	Penicillin
Tooth socket infection	Novobiocin sodium and streptomycin
Infected Bartholin's cyst	Ampicillin

DISCUSSION

Although it has been accepted for many years that there is an association between herpes simplex infection and erythema multiforme (Urback, 1933; Forman and Whitwell, 1934; Anderson, 1945), there have been few attempts to determine the relative incidence of this and other possible aetiological factors in a series of unselected patients with erythema multiforme. It has been stated that the association of herpes simplex lesions with erythema multiforme could be observed in more than 15 per cent of patients who have recurring erythema multiforme (Shelley, 1967). In our study, however, herpes simplex infection was associated with the rash in 62.8 per cent of patients with recurrent erythema multiforme, but by contrast only 9.5 per cent of patients with a single attack of erythema multiforme had associated herpes simplex infection. The recurrent nature of herpes simplex infection is the most probable explanation for the striking difference between the incidence of associated herpes simplex in these two groups. In addition, since this was a retrospective study in which patients have completed a questionnaire at least nine months after the attack with which they presented, it is probable that any patient with latent herpes simplex will have had further overt attacks. It is also perhaps relevant that this study has been carried out in a population in which herpes simplex virus-specific IgG antibody is found in 84 per cent of healthy blood donors when the sera were tested at a serum dilution of 1:5 (Haire, Frazer and Millar, 1973).

Recently, evidence has been produced of an association between herpes simplex virus type 2 (herpes genitalis) and erythema multiforme (McDonald and Feiwel, 1972; Britz and Sibulkin, 1975). In our study no patients were recorded as having herpes genitalis at the time of presentation though vaginal examination was not routinely carried out on all female patients.

Several groups of workers have suggested an association between Mycoplasma pneumoniae infection and both the Stevens-Johnson syndrome and erythema multiforme minor (Ludlam, Bridges and Benn, 1964; Gordon and Lyell, 1970). In our series we found little evidence to associate erythema multiforme with infections which might have been of mycoplasmal origin. Nevertheless, it is relevant that the incidence of Mycoplasma pneumoniae infection in Northern Ireland is relatively high, antibody being present in low titre in approximately 70 per cent of the population (Connolly, 1976).

Many different drugs have been cited as possible aetiological factors in the production of erythema multiforme throughout its clinical range from a relatively minor complaint to the Stevens-Johnson syndrome (Bianchine *et al,* 1968; Shelley, 1967). In our study a drug was the single factor associated with erythema multiforme in only 7.1 per cent of patients while drugs werepossibly involved in a further 11.9 per cent of patients.

The relative importance of drug-induced erythema multiforme may vary with variations in drug-prescribing habits. In the past (B.M.J. Leading Article, 1964; Carroll, Bryan and Robinson, 1966) long-acting sulphonamides have been a major association with erythema multiforme including the Stevens-Johnson syndrome. These drugs are now less commonly prescribed but it is interesting to note that in our series a drug combination (trimethoprimsulphamethoxazole) containing a sulphonamide produced erythema multiforme on five occasions in one patient and may have been responsible for a single attack in another patient.

In view of the high proportion of herpes-associated cases in recurrent erythema multiforme in this series, further investigation might usefully concentrate on this group of patients and on the possible role of immunological mechanisms in producing the skin lesions.

SUMMARY

A retrospective study of 85 patients with erythema multiforme was undertaken by means of a questionnaire.

In 43 patients with more than one attack of erythema multiforme the attacks were associated with herpes simplex infection, throat infection, drug administration, and other miscellaneous factors in 27, 1, 2 and 6 patients respectively. There was no obvious associated factor in 7 patients.

ACKNOWLEDGMENTS

We thank the consultant dermatologists of Northern Ireland for permission to study their patients, and Dr. Margaret Haire and Dr. Grace E. Allen for their advice and encouragement.

This work was carried out when one of us (T.H.H.) was in receipt of a grant from the Eastern Health and Social Services Board.

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TRIAL OF FOLIC ACID THERAPY IN PSORIASIS

T. A. J. DAWSON and K. W. SCOTT
(Department of Dermatology, Craigavon Area Hospital)
and J. D. MERRETT
(Department of Medical Statistics, The Queen's University of Belfast)

PATIENTS suffering from psoriasis frequently have a low serum folate (Knowles, Shuster and Wells, 1969; Shuster, Marks and Chanarin, 1967). It is usually accepted that this is due to loss of folate in the psoriatic desquamation (Hild, 1969), though it has been suggested that increased utilisation of folate is possibly a more important factor (Touraine, Revuz, Zittoun, Jarret and Tulliez, 1973). No matter what the true explanation may be, the serum folate is undoubtedly often reduced in psoriasis, and it was decided to examine the effect of administering folic acid to patients suffering from psoriasis in the hope that it might be of therapeutic benefit.

METHOD

A double blind trial using the 5 mg tablet of folic acid (BP) and inert facsimiles (manufactured by Arthur H. Cox & Co. Ltd., Brighton) was carried out as follows. Patients suffering from typical and extensive psoriasis were included in the trial provided they were over 18 years of age and gave their informed consent. Before starting the trial, each patient's peripheral blood was examined and the serum vitamin B12 and folate levels determined. Patients selected for the trial were allocated at random into test and control groups. Patients in the test group took one 5 mg tablet of folic acid (BP) twice daily for six weeks, and patients in the control group took an inert facsimile twice daily for six weeks. The tablets were dispensed in coded boxes and distributed to the patients at the clinic without the dermatologists or the patients being aware which boxes contained active and which inert tablets. Hydroxocobalamin in a dose of 2,000 micrograms was administered by intramuscular injection to all patients on commencing the trial and another 1,000 micrograms once weekly until they ended the trial. The hydroxocobalamin was given as a precaution against the possibility of folic acid precipitating a neuropathy should any of the patients have incipient Addisonian anaemia. During the trial no conventional medication for psoriasis such as dithranol paste was employed, though in some cases emollients were permitted. Each patient remained under the care of one dermatologist (T.A.J.D., 16; K.W.S., 5). At the end of the trial period patients were clinically assessed and classified as showing no definite change, definite improvement or definite deterioration in their psoriasis.

RESULTS

Twenty-two patients entered the trial and 21 completed it. Table 1 shows that the two groups did not differ significantly (at $P<0.05$) with respect to the effects of the treatment.

TABLE 1: EFFECT OF FOLIC ACID ADMINISTRATION IN PSORIASIS

	Patients		
Clinical assessment	*Folic acid group*	*Control group*	*Total*
Definite improvement	3(25.0%)	2(22.2%)	5(23.8%)
No definite change	9(75.0%)	6(66.7%)	15(71.4%)
Definite deterioration	0(—)	1(11.1%)	1 (4.8%)
Total	12(100%)	9(100%)	21(100%)

$P=0.78$

DISCUSSION

As there is no significant difference in respect of the effect of treatment (at $P<0.05$) between the patients who received folic acid and those who received inert facsimile, there is little evidence for rejection of the null hypothesis that folic acid and inert tablets have a similar effect on psoriasis. However, with the relatively small number of patients participating in the trial, only large differences in treatment effects are likely to be detected at the 5 per cent level.

Apart from the absence of therapeutic benefit, the fact that no evidence of an adverse effect was detected is of some interest in view of the widespread use of folic acid antagonists in the treatment or psoriasis.

SUMMARY

A double blind trial of folic acid therapy in psoriasis was carried out in 21 patients over a period of six weeks. The results indicate neither a beneficial nor an adverse effect.

ACKNOWLEDGMENT

We wish to thank the Southern Health and Social Services Board, Northern Ireland, for a grant made in support of this trial.

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SEVEN DISTINGUISHED MEDICAL GRADUATES HONOURED BY THE ULSTER MEDICAL SOCIETY

In 1977 the Council of the Ulster Medical Society decided to revive the granting of Honorary Fellowship after a lapse of many years. The Honorary Fellowship is the highest honour that the Society has to confer. At a ceremony in the Royal Victoria Hospital on 1st June 1977, the President of the Ulster Medical Society, Dr. Trevor Hamilton, presented illuminated certificates of Honorary Fellowship to these seven distinguished colleagues in recognition of their outstanding professional achievements and their contributions to the Society.

RICHARD SYDNEY ALLISON

SIR JOHN HENRY BIGGART

WILLIAM GEORGE FRACKELTON

SIR IAN FRASER

JAMES STEVENSON LOUGHRIDGE

CHARLES HORNER GREER MACAFEE

JOHN EDGAR MORISON

In paying tribute to the new Honorary Fellows, Dr. Hamilton chose to dwell on some of the factors common to the lives of them all. Firstly, all are Ulstermen and were educated at Ulster schools. Secondly, all walked the wards of the Royal Victoria Hospital as medical students and became graduates of the Queen's University of Belfast. Thirdly, after qualification all returned to the Royal as registrars or as pre-clinical or clinical teachers and gave much in return for the teaching they themselves had received there.

Fourthly, all had been associated with, and several had attained high office in, the Royal Colleges of the specialties they had followed— physicians, surgeons, obstetricians and gynaecologists, pathologists and general practitioners. Fifthly, all had been enthusiastic supporters of medical associations and societies and had devoted much time to the specialist medical societies.

Sixthly, all had supported particularly strongly the Ulster Medical Society, and each had occupied with distinction the Presidential chair. Finally, all had brought honour to the Society and to Ulster through their outstanding professional achievements.

The President ended by saying that many in the province had reason to thank the seven new Honorary Fellows for their professional expertise but that those gathered to honour them were themselves honoured by having had the privilege of knowing them as close colleagues and friends.

MICHAEL E. SCOTT,
Secretary Ulster Medical Society.

BOOK REVIEWS

ESSENTIALS OF GERIATRIC MEDICINES. By George Adams, C.B.E., M. D., F.R.C.P. (Pp. xi + 98. £1.95). Oxford: Oxford University Press, 1978.

AS the specialty of geriatric medicine enters its thirtieth year a number of the leaders and pioneers in the field have produced textbooks. These books encompass the knowledge of the care of elderly patients which has been built up during these years mainly by the efforts of these eminent doctors. To these books Professor Adams has written his own small guide for students. One of the problems of writing a textbook of geriatric medicine is to decide how to deal with the many diseases which are common to adults of all ages and which are adequately described in standard and long-established textbooks of medicine. Naturally, textbooks of geriatric medicine emphasise the problems of diagnosis, treatment, rehabilitation and continuing care of elderly patients. Having done this, they have the choice of either repeating the descriptions of many diseases which are well described elsewhere or of leaving them out, rsulting in a book which gives an unbalanced picture of the medical content of geriatric medicine. Professor Adams has successfuly coped with this problem by dividing his book into four sections. The first section describes the process of ageing and contains, as its main feature, an invaluable and unique table describing the age changes in various systems of the body, including those which are regarded as "normal". and those which are pathological. The next section of the book is entitled "Essentials of geriatric clinical practice" and describes the special features of the presentation of disease in old age. The third and longest section of the book covers the common complaints in old age and is problem rather than disease orientated. Many common diseases are not described in detail but the way in which they contribute to the common complaints of old age are outstanding. The last section of the book deals with the use of drugs in the elderly, a topic which is coming under increasing attention. This book is an important contribution to education in geriatric medicine and its appearance adds further distinction to its author and to the Belfast Medical School.

R.W.S.

FUNDAMENTALS OF HEARING: AN INTRODUCTION. By William A. Yost and D. W. Nielson. (Pp. 220; illustrated. £10). Philadelphia, Saunders and Eastbourne: Holt-Saunders, 1977.

THE authors emphasise in the preface that this book is only an introduction to the subject. This is alarming, because it is doubtful if there are more than a few in the British Isles for whom the contents of this book are basic knowledge, and these are not practising E.N.T. surgeons. This is not a criticism of the book but it illustrates the way that E.N.T. surgeons in this country have failed to keep abreast of the science of audiology. We have in "Fundamentals of Hearing" an easy opportunity to fill this gap, so long as our knowledge of physics is not too hazy.

The arrangement of the book is excellent. The three main subject headings are "The Physics of Sound", "Auditory Anatomy and Physiology" and "Psychophysics and Auditory Perception", with at least three chapters in each section. Each chapter has a summary and a supplement. In the supplement we are given an insight into the contents of the chapter. This includes reference to the investigators and their early experiments, to controversy in the past about matters that are now generally accepted, and current doubts on matters that have long been held to be true. Keeping this type of information to a separate section at the end of each chapter enables an uninterrupted flow in the text.

Although it is not the only such text available, all those who are involved with the ear or hearing would benefit from having ready access to this book where they can find, quickly and easily, concise explanations of the workings of the numerous parts of the ear.

A.G.K.

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THIS short soft-backed book is written by a general practitioner who is an experienced hypnotist and a member of the British Society of Mental and Dental Hypnosis and of the International Society of Hypnosis. It is a clearly written account of the techniques required for induction of hypnosis, the clinical properties of the hypnotic state and the indications for hypnosis in dentistry, general practice, obstetrics and hospital practice. There is an interesting section on the factors which influence susceptibility to hypnosis and an account of tests of hypnotic susceptibility. Like all short textbooks, the style is dogmatic, with consequent inaccuracies in fact, especially in the section on the use of hypnosis in neurotic conditions, where in addition a number of references are very dated. Nevertheless this little book can be recommended as an introduction to the theory and practice of hypnosis for medical students and family doctors.

G.W.F.

EAR, NOSE AND THROAT—SURGERY AND NURSING. By R. Pracy, J. Siegler, P. M. Stell and J. Rogers. (Pp. vii + 192; figs. 77. Paper £1.95, board £3.95). London: Hodder and Stoughton, 1977.

AS a means of educating nurses about the diseases of the E.N.T. region this volume has some value.

The general information regarding anatomy and physiology is clearly set out and well illustrated. The chapters concerning deafness in children, nasal catarrh and the use of hearing aids provide the information which community nurses require to play their role to the best effect.

Unfortunately there is rather too much detail of surgical procedures throughout and a number of incorrect statements about ear disease and its complications which could be dangerously misleading.

The best sections are those which concern nursing care which are clearly written and most appropriate.

D.L.G.S.

A TEXTBOOK OF MEDICAL PRACTICE. By J. Fry, P. S. Byrne and S. Johnson. (Pp. 645. £9.95). Lancaster, Lancs.: 1977.

AS medical practice or the care of patients is the same whether practised in the community or in hospital with the same high standards required in both, there should be no objection to an essentially hospital doctor reviewing a text book about general practice.

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I have several quibbles. Few would agree with the enthusiastic advocacy of adrenal steroids for bronchial asthma or the advice about the use of ACTH, and the treatment for tuberculosis is now out of date; in the specialised gynaecological chapter there are one or two notable errors e.g. amenorrhoea is said to be caused by dwarfism and, more remarkably, by Klinerfelter's syndrome! These lapses will undoubtedly be corrected in future editions, for the book should prove popular with both undergraduate and postgraduate students; it is thoroughly recommended.

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J.V-O.

A DICTIONARY OF MEDICAL ETHICS. Edited by A. S. Duncan, G. R. Dunstan and R. B. Welbourn. (Pp xv + 335. £4.90). London: Darton, Longman and Todd, 1977.

TODAY both doctors and the general public are constantly being made aware of a whole series of ethical problems connected with medicine. Press. radio and television frequently highlight questions such as the provision of kidney machines, the effects of measles vaccines, or the right of a woman to seek an abortion. "A Dictionary of Medical Ethics" seeks to provide accurate information and a sane moral judgment on these and on a great many other questions of medical ethics. The contributors include many distinguished medical men in the United Kingdom, and Ulster readers will be pleased to see that two are from Northern Ireland. The book deals principally with four subjects.

The first of these is an examination of those forms of medical treatment which have moral questions closely connected with them. For example, Dame Josephine Barnes, in the article on abortion, supports the present English Act but notes that gynaecologists generally are more critical of it than general practitioners. To this the distinguished moral theologian, Canon Dunstan, adds some paragraphs on the proper place of abortion as an operation, but opposes it as a matter of family convenience.

The second group of subjects with which the books deals are those personal problems about which doctors are very likely to be consulted. There are articles on drug addiction and alcoholism, with consideration of the extent to which the latter is properly viewed as a disease. Today there is constant discussion on how far a patient suffering from a serious or terminal illness should have this clearly stated to them, and this Sir John Croon discusses in his article on clinical practice. Doctors are constantly consulted on marriage problems, and guidance is offered on marital pathology and counselling. Professor C. M. Fletcher discusses the importance of proper communication between doctor and patient, and Dr. P. D. Scott deals with a matters not infrequently raised in Northern Ireland, the duty of doctors towards prisoners.

A third set of articles faces the problems raised by the nature of our complex society. A national health service makes great demands on the the time a doctor can give to his patients. It also requires difficult decisions on the proper use of limited resources. Similarly, the use of computers raises questions about the ready assessability of medical records. In a day when research, not improperly, is highly thought of, problems do arise about justifiable clinical trials, on the place of consent and on human experiment, and all these subjects are taken up.

Fourthly, our multiracial society has suddenly made us aware of the differing attitudes to medicine of the great world cultures and religions, and articles on these are now of more than academic interest.

In summary, this dictionary is neither pharasaical nor permissive in its moral judgments, and is an excellent book of reference.

J.L.M.H.

In recent years the enormous development of medicine, biology and the social sciences has created a growing concern and awareness of the ethics involved in many of these advances. There are few health problems which do not have ethical or moral implications and increasing attention is being focussed on the training of doctors in these matters. This DICTIONARY OF MEDICAL ETHICS provides a ready source of information and guidance on all subjects likely to concern medical practitioners in their work. Each entry gives a brief definition of the matter under discussion and describes the medical procedures involved. It is followed by a full presentation of the ethical issues. Key references and guides for further study are provided for all but the briefest entries. The editors, a medical educator, a theologian and a surgeon, are to be congratulated on producing a volume which is sure to find acceptance as the authoritative and definitive work on the subject. It is an excellent production, wide-ranging and up-to-date. It can be wholeheartedly recommended and all doctors should possess a personal copy for ready reference. This dictionary is destined to be a medical best seller.

D.A.D.M.

PROGRESS IN MEDICAL GENETICS. New Series. Vo. 2. Edited by Arthur G. Steinberg, Ph.D., Alexander G. Bearn, M.D., Arno G. Motulsky, M.D., and Barton Childs, M.D. (Pp. 290; Illustrated; £18.25). Philadelphia: W. B. Saunders Company and London: Holt-Saunders. 1977.

THIS second volume of PROGRESS IN MEDICAL GENETICS New Series, well illustrates the diversity of subjects which falls within the purview of the medical geneticist. In keeping with previous volumes, there is a mixture of articles of clinical significance, mechanisms of disease and human variation. There are six reviews by a number of authorities.

One of the most interesting topics is the review by D. J. H. Brock which deals with biochemical and cytological methods in the diagnosis of neural tube defects. In 1972 the author discovered the association of a raised amniotic fluid alphafetoprotein level with anencephaly. Since then the area has developed very rapidly indeed. He discusses the advantages and disadvantages of the measurement in the serum of women who have not had an affected child. Dr. Brock believes that the time is not far distant when every pregnancy may be profitably tested.

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The final review, by Patricia A. Jacobs, concerns the morphologic differences which exist between the homologues of certain human chromosomes. With the techniques of banding, many new heteromorphisms (variants) have been described. Classification, frequency, racial variation and clinical significance are dealt with. She forecasts that when objective methods of mensuration are available heteromorphisms will take their place alongside conventional blood group and enzyme polymorphisms as tools in formal and population genetics.

Undoubtedly, this is a book for the specialist in medical genetics but will provide useful reference source for other specialists. The price £18.25 is such that probably only medical libraries will be able to put it on their shelves.

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THIS little book should be of help to medical students who have difficulty understanding the anatomy of the central nervous system. It is simply and clearly written and is profusely illustrated. Postgraduate students should find these excellent diagrams helpful when studying neurology for higher degrees.

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J.H.D.M.

PROGRESS IN MEDICAL GENETICS. New Series. Vo. 2. Edited by Arthur G. Steinberg, Ph.D., Alexander G. Bearn, M.D., Arno G. Motulsky, M.D., and Barton Childs, M.D. (Pp. 290; Illustrated; £18.25). Philadelphia: W. B. Saunders Company and London: Holt-Saunders. 1977.

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This relatively cheap paperback book is in no way comprehensive and thus perhaps cannot be properly regarded as a textbook, but very few aspects of clinical haematology are omitted, although less emphasis is given to the laboratory aspects.

What distinguishes this book is the quality of writing, the author's style being very readable and lucid. For anyone preparing for higher examinations in pathology or general medicine this book could be highly recommended and it would also give interest and pleasure to those not necessarily preparing for examinations but wishing to be up to date in this field.

J.M.B.

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Dr. Morton's views on control point the way for increased co-operation between doctors in the public field and practising clinicians. He stresses the importance of public education and the education of young people in groups of the dangers of infection and where advice and treatment may be obtained if the need arises.

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The book is a most comprehensive text where not only the clinician, but also those interested in the pathology of neonatal life, will find data on nearly any aspect and an up-to-date and well-chosen list of references at the end of each sub-section. Some may doubt if so many co-authors were really necessary or useful. They will welcome, for example, the clarity and integration of the discussion on "Disorders of the respiratory system", where the hand of Dr. Avery may be discerned, and compare it to some short sub-sections revised by other contributors. Anyone who has striven to maintain a large and fully-documented single-author textbook on this rapidly progressing field will agree that some sub-division of authorship is now necessary if such a book is to reflect current knowledge.

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J.E.M.

PATHOLOGY OF THE SPINAL CORD. By J. Trevor Hughes, Second Edition Pp. xii + 256; figs. 74. £7.50) London. Lloyd-Luke (Medical Books) Ltd. 1977.

TO some readers the separation of the spinal cord and brain may seem arbitary since similar pathological principles can be applied throughout the central nervous system. However, the concept of 'selective vulnerability' is particularly applicable to the central nervous system and certain diseases show a predelection for specific anatomical sites within the nervous system. In this respect the spinal cord deserves special treatment and it is with this aim that this book has been produced.

Dr. Hughes has written a clear and concise account of the pathology of the spinal cord first for the clinician concerned with the management of patients with paraplegia and tetraplegia and secondly for the general pathologist who rarely examines the spinal cord at necropsy and encounters technical and interpretive difficulties when he does. The text is clear, the illustrations well-chosen and the selected references provide useful sources to those who wish to delve deeper. This moderately priced book is highly recommended.

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