Women's phenotypes may be derived from the M.4 chart, using the same absolute scales. Their phenotype distribution is reported. The possibility of subsequent correction of this distribution is discussed.

Weight variation at a given age is discussed in relation to phenotyping both healthy persons and mental hospital patients.

Disposition to mental breakdown is measured in terms of phenotype frequency in patient and control series. (The phrase "somatotype frequency" is reserved for the young men who were photographed and typed by Sheldon's criteria.) There was a highly significant tendency for mental disturbances to occur more often in Sheldon's endomorphic ectomorphs—that is, a linear build with proportionately more fat than muscle—type Lf. More muscular young men, especially endomorphic mesomorphs (type Mf), were much commoner in the healthy sample. For example, phenotype 452 was five times more common among healthy young men, phenotype 325 six times more common among patients.

The somatotype distribution of other young men patients, excluding students, showed similar significant trends.

Among women under 30, disposition to breakdown was once again significantly much greater in Lf phenotypes. In sector Fl there was about average expectation of breakdown. Lastly, in sector Fm there was a significantly higher proportion of healthy students.

APPENDIX : NOTE ON SUBCUTANEOUS TISSUE CALLIPERS

The subcutaneous tissue callipers ("Q") used throughout this work are no longer in production. Their specification, and that of the Harpenden callipers now available, are given by Tanner and Whitehouse (1955). Unfortunately, the equation they gave for transforming "Q" measurements to Harpenden equivalents is unworkable owing to an error. A set of Harpenden Total Skinfold measurements in millimetres is therefore provided in the table below for each age group to replace the "Q" figures given in Fig. 1 if Harpenden callipers are used.

Equivalent Skinfold Measurements Using Harpenden Callipers

Age	Total of Three Skinfold Measurements													
16-24	10	12	14	17	20	24	29	36	45	57	73	93	114	
25-34	12	14	17	20	24	30	38	48	60	74	94	114	+	
35-44	13	16	19	22	27	35	44	55	68	87	109	+	+	
45-54	14	17	20	23	29	37	47	61	74	95	118	+	+	
Estimate F	1	1½	2	2½	3	3½	4	4½	5	5½	6	6½	7	

Based on 180 duplicated measurements partially selected to cover the scale

The Harpenden callipers have two advantages—the spring loading varies relatively little as the jaw opens, and, secondly, the dial is capable of more accurate measurement. They have one serious disadvantage: the needle takes time to settle. Repeated studies with serial photographs of calliper dial and stopwatch show that even in the lower part of the scale the needle settles by variable amounts up to 1 mm. in the first 10 seconds after the callipers are applied, and continues to move for 30-45 seconds or so afterwards. In the upper part of the scale, it moves as much as 2-4 mm. in the first 10 seconds. The accuracy of the procedure should not be overrated.

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THE CONCEPT OF MEDIASTINAL PAIN

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The usual patterns of pain occurring in ischaemic heart disease, hiatus hernia, and pericarditis are well recognized. Many clinicians, however, will remember having seen patients with a history of sudden or severe chest pain somewhat similar to, or even identical with, that occurring in myocardial infarction, but in whom a subsequent diagnosis of carcinoma of the lung or other condition involving the mediastinum was ultimately proved. There is no doubt that chest pain can arise from the involvement of several different pain-sensitive structures in the mediastinum by various pathological processes, and the following case reports illustrate the fact that the patterns of pain resulting may cause considerable difficulty in diagnosis. Interesting variations in the sites of pain reference have also been noted.

Bronchial Neoplasm with Mediastinal Involvement

It is not rare for new growth of the bronchus to present with a sudden excruciating central chest pain which may be mistaken for the pain of myocardial infarction. It is similar in character, radiating up into the neck and jaw and down into the arms, but with the significant addition of a component of pain which radiates up into the head, scalp, face, and ears. Furthermore, the pain is repeated at longer or shorter intervals. In the first instance such a pain may be regarded as due to myocardial infarction, but with recovery and then repeated attacks without confirmatory electrocardiographic evidence, the diagnosis of myocardial infarction becomes untenable. Most physicians will have seen such patients who were regarded as having cardiac pain, and subsequently a neoplasm of the bronchus with mediastinal involvement has been found.

Interestingly, in one case of carcinoma of the left upper lobe bronchus referral of pain to the left side of the head occurred.

Case 1.—A man of 49 years was awakened from sleep one night with severe retrosternal pain followed in several minutes by left hemiparesis of considerable severity. He vomited. The pain then radiated to the left elbow and lasted about one hour. This recurred twice subsequently, and none of the attacks was induced by exertion or change of posture. An unproductive cough developed at about this time. Examination revealed a sthenic man with a dry cough. There was moderate hypertension. The percussion note was slightly impaired over the left lung apex anteriorly. An E.C.G. tracing was normal. A chest x-ray film revealed a mass in the region of the aortic knuckle (Figs. 1 and

2), which was subsequently shown to be a bronchial carcinoma. Six months later, necropsy revealed widespread carcinoma, originating in the left upper lobe bronchus, involving the mediastinum and with metastases in bones and brain. No myocardial infarction was found.

Case 2.—A woman aged 52 had a chest infection with an abnormal shadow in the left lower lobe. The shadow grew and the lung was excised. The lesion was found to be squamous-cell carcinoma with histologically proved lymph-node involvement. Later there were attacks of very severe retrosternal pain with radiation into the face and head, and, in particular, pain was felt in a premolar on the right side of the lower jaw; the pain also radiated into the left arm. A pleuro-pericardial friction rub was present with each exacerbation of pain. No electrocardiographic evidence of myocardial infarction was found in any of several tracings.

FIG. 1.—Case 1. X-ray film showing a mass in the region of the aortic knuckle.

FIG. 2.—Case 1. X-ray film taken three months after Fig. 1. The lesion was a carcinoma of the left upper lobe bronchus.

It seems certain that this pain originated in the mediastinal structures which were invaded by new growth and that mediastinal pleurisy was associated.

Case 3.—A seaman aged 38 developed severe aching pain in his chest in December, 1950. It was situated in the centre of his chest, radiating down the inside of his left arm and the outside of his right arm. It also went through into his back. The pain was so excruciating that it made him weep, lasted altogether four days, and then disappeared completely. He was thought to have an atypical myocardial infarction without E.C.G. changes. In June, 1951, the pain recurred and he was a little short of breath. In July, 1951, the pain recurred again; it was felt between the shoulder-blades and went up into his neck. In February, 1952, he had another attack of a very severe pain which lasted a week. At this time it included his shoulders and his neck, and reached up to his right cheek. Immediately before admission to hospital the pain in his arms started again, and was very severe. An x-ray film of the chest showed a large mediastinal tumour. Biopsy showed a poorly differentiated carcinoma, the origin of which was doubtful.

Mediastinal Gland Involvement by Reticulosis, Sarcoidosis, Tuberculosis, or Secondary Neoplasm

When mediastinal glands are involved in these conditions the patient may present with pain which is identical with the pain described above. A significant diagnostic feature again is the radiation into the head and face. Here also the diagnosis may be obscure until obvious glandular enlargement is found in the chest x-ray film, and this development may be delayed for weeks or even months.

Case 4.—A woman aged 36, 3½ months pregnant, complained of cough of two years' duration and intermittent attacks of pain of varying degrees of severity which were felt in the left side of the face. The pain came first in the upper jaw, spread into the lower jaw, then into the face below the left eye and finally to the scalp on the left side. There was a gradual spreading of the pain until all the sites mentioned were involved. It had been present intermittently for three months, but then became continuous. In addition, she noticed increasing shortness of breath, and for two months she had increasing "indigestion." This was a nasty burning sensation deep inside the chest, unrelated to food or posture and not relieved by powders. An x-ray film of the chest showed a mass in the left lower lobe with a paramediastinal mass in the upper part of the left hilum. At thoracotomy malignant glands in the mediastinum and a massive invasion of the left lung by growth were found. The patient died eight months later following the birth of a normal child. Necropsy showed multiple metastatic carcinoma, histologically very anaplastic, the primary growth being probably in the breasts.

Case 5.—A man of 55 developed dull persistent pains in the right shoulder followed by malaise and then pains in the left shoulder. One morning he experienced sudden agonizing pain in the back and around the chest which spread widely up into the throat, jaws, face, ears, especially the left ear, to the top of the head and down both arms to the elbows. The pain persisted severely for about two weeks and then less severely for about three months, and was accompanied by shortness of breath and hoarseness of the voice. Physical examination revealed loss of weight and breathlessness. The left vocal cord was found to be paralysed. The blood pressure was normal and there was no inequality of the pulses. Chest x-ray examination revealed widening of the superior mediastinum and a small indefinite shadow in the left lower lobe. Bronchoscopy was normal, apart from the paralysed left vocal cord. An E.C.G. tracing was normal. Wassermann and Kahn reactions of the serum were negative. A course of palliative deep x-ray therapy was given to the superior mediastinum with relief of pain, but the patient died five months after the appearance of the first symptoms. Necropsy revealed carcinoma of the lung with secondary deposits in the mediastinal glands.

Case 6.—A man of 37 developed an intermittent fever with nocturnal sweats, lassitude, and pain in the left buttock. He then suffered from a constant ache in the upper part of the left side of the chest, which passed to the shoulder and scapular region. This was accompanied on occasions by a sharp needle-like pain felt deeply behind the sternum, shooting up to the left side of the neck synchronously with each heart beat, the attacks lasting several minutes and dying away slowly. He also noticed itching of the skin. Chest x-ray films revealed widening of the

superior mediastinum (Fig. 3), and bronchoscopy was normal. A blood count showed a polymorphonuclear leucocytosis (84% of 16,000 leucocytes per c.mm.) and an E.S.R. of 80 mm. per hour (Westergren). A provisional diagnosis of malignant lymphoma was made and a course of deep x-ray therapy instituted, which resulted in considerable relief of the pain. Several months later, however, irregular fever recommenced and several rubbery non-tender glands appeared in the left supra-clavicular region. Biopsy of these glands showed Hodgkin's disease. The patient's condition steadily deteriorated and he died three years after the appearance of the first symptom. Necropsy revealed extensive deposits of lymphadenoma tissue in almost all viscera, including bone marrow.

FIG. 3.—Case 6. X-ray film showing widening of superior mediastinum, found to be due to Hodgkin's disease.

Cardiac Pain

Cardiac pain occurs with angina pectoris and with myocardial infarction, and both these are sufficiently well recognized not to require detailed description here. Pain of ischaemic cardiac disease may, of course, be experienced at first in one of the peripheral sites of radiation, such as the thumb, hand, or elbow, and it is only later, perhaps after months, that it is felt in the typical central position.

Apart from the commonly recognized sites of pain reference, pain may be felt in the head, and, as the following cases show, it is not possible to say that face and head pain occurs only in those cases where the mediastinum is involved in a neoplastic process.

Case 7.—A man of 52 was admitted to hospital having experienced a severe occipital headache which persisted for some hours and was followed 18 hours later by severe retrosternal pain which was worse on coughing and breathing. He was restless and short of breath. He was found to have an anterior myocardial infarction with early heart failure. No friction rub was heard at any time and no evidence of subarachnoid haemorrhage or cervical spondylosis was found.

The fact that respiratory movements very occasionally aggravate the pain of myocardial infarction may be a source of confusion. Not only may pain be referred to the occiput, as in the above case, but also to the vertex of the head, without any pain being experienced at the same time in the neck or jaws.

Case 8.—A man aged 46 had several attacks of angina pectoris with pain retrosternally, followed immediately on each occasion by headache at the top of the head. There was no sense of pain or constriction in the neck or jaws at any time. The last attack was associated with myocardial infarction, a typical pattern of through-and-through postero-lateral infarction being obtained on electrocardiography. Vertical headache was a feature of this attack also.

The absence of evidence of cervical spondylosis in the above two cases is stressed because spondylosis may cause occipital pain which can be referred to the vertex of the head or even as far forward as the forehead. Furthermore,

radiation of pain in the fourth to eighth cervical dermatomes arising from spondylosis may superficially resemble the pain of myocardial ischaemia. Careful history-taking and physical examination, however, will almost invariably enable the clinician to arrive at the correct diagnosis. In this connexion, Case 9 is of interest.

Case 9.—A man of 61 was referred to hospital with a provisional diagnosis of arthritis of the left shoulder. Two weeks previously he experienced retrosternal pain which came on after moderate exertion and which spread to the left shoulder and down the arm to the fingers. It was relieved by rest and recurred on slight exertion, but he stated that the ache in the arm itself was almost continuous. An E.C.G. tracing showed the changes of posterior myocardial infarction. He was treated with rest in bed, analgesics, and anticoagulants. The chest pain was relieved but that in the arm persisted. It was found that this pain could be aggravated by lateral flexion or rotation of the neck and that the movements of the latter were limited. An x-ray film of the cervical spine revealed gross osteoarthritic changes and disk degeneration in the lower part of the cervical spine with angulation between the fourth and fifth cervical vertebrae (Fig. 4). The patient experienced considerable relief from the pain in the arm when the neck and back were kept extended, and a cervical collar was fitted.

FIG. 4.—Case 9. X-ray film of cervical spine. Gross osteoarthritic changes are present, with narrowing of disk spaces and angulation between the fourth and fifth cervical vertebrae. A cervical collar had been fitted when this film was taken.

Pericarditis

This condition is often painless, and in uraemia, for example, a loud pericardial friction rub may be present without the patient being aware of any discomfort. Acute non-specific pericarditis, however, may be very painful, and the distribution of pain is similar to that of myocardial infarction. On occasion it is described as a tight constricting band round the lower chest. Frequently the pain is aggravated by respiration. Where there is a large effusion, a dull retrosternal discomfort or pain is often described.

Case 10.—A man of 45 was admitted to hospital with a severe chest pain of eight hours' duration. He had been quite well previously until he was awakened from sleep at about 3 a.m. one day with sudden severe chest pain felt retrosternally, radiating up towards the neck. The pain was burning in type and was aggravated by deep breathing and movement. The pain was eased only when he lay still with a hot-water bottle on his chest. On physical examination he did not look ill, but respiration was shallow. Both the temperature and the pulse were slightly raised, no pericardial friction rub was heard, and other findings, including chest x-ray examination, were normal. An electrocardiogram showed elevated ST segments in leads I, II, and III. The pain subsided in the next two days and a repeat electrocardiogram five days later was almost normal.

Case 11.—A man of 31 with established aortic stenosis of rheumatic origin was admitted to hospital with history of listlessness for one week and retrosternal pain for one day. The pain came on gradually and was constant, but was aggravated by deep breathing. It did not radiate. Three weeks previously he had had a sore throat. He was found to have an acute rheumatic exacerbation with a high remittent fever but a fixed pulse rate of 60 beats a minute due to complete heart-block. Three days later the pain, which had persisted, suddenly became very severe, jabbing, and, as before, was greatly aggravated by respira-

tion. A harsh leathery pericardial friction rub was audible. The blood urea concentration was normal. He died suddenly several days later. Necropsy revealed widespread acute fibrinous pericarditis and calcific aortic stenosis. Numerous Aschoff nodules were found in the myocardium.

Aneurysm of the Aorta

Fusiform or saccular aneurysm of the thoracic aorta may give rise to pain in the chest, especially if it enlarges rapidly or presses on pain-sensitive structures (Case 12). Intense boring pain may be experienced where pressure on spine or ribs occurs and erosion of bone results. In syphilitic aortitis the coronary ostia may be partially occluded, and this, combined with the frequently associated aortic incompetence, may give rise to intractable angina pectoris at rest, with or without myocardial infarction.

Case 12.—A man of 40 was seen at hospital with a two-months history of a dull aching pain across the front of his chest, with malaise and shortness of breath on exertion. The pain was

FIG. 5.—Case 12. X-ray film showing a large aortic aneurysm.

constant, but was eased by his walking "round-shouldered." It was aggravated by coughing and deep breathing but not at that time by exercise. At times it spread to both axillae, shoulders, and back. A history of previous venereal infection was obtained. Physical examination revealed evidence of aortic incompetence, and an area of diffuse systolic pulsation and dullness to percussion was found to the left of the upper half of the sternum. The blood Wassermann reaction was strongly positive and an aortic aneurysm was demonstrated on chest x-ray examination (Fig. 5). Penicillin was given in large doses and a thoracotomy was performed. As the aneurysm could not be excised, it was wrapped in "orlon" cloth. Post-operative recovery was satisfactory and complete relief from pain was obtained.

Dissecting Aneurysm

Dissecting aneurysm is, in most cases, an excruciatingly painful condition, the pain, depending on the site of the initial intimal tear, starting in the chest or abdomen and spreading through to the back between the shoulder-blades and often down the arms and elbows. Paraesthesiae may be felt in the limbs, probably due to interference with the blood supply to nerves and nerve plexuses. Inequality of the pulses is a valuable sign where this condition is suspected.

Oesophageal Pain

Oesophageal Spasm.—Many normal persons have experienced the short-lived but extremely unpleasant sensation which is usually brought on by swallowing liquids, especially

cold liquids, or solids rapidly. An acute sensation of pain develops deep in the chest and spreads round the thorax. It is constricting in character and may radiate into the back and into the neck and arms down to the elbow. It rises rapidly in a crescendo to considerable discomfort and then dies away slowly. It is likely that such pain originates in muscle spasm of the oesophageal wall. A similar longer-lived sensation is sometimes felt by patients who have cardiospasm (achalasia) in the early stages of the disease, and then it may be the major symptom and overshadow the discomforts of dysphagia.

Oesophageal Irritation and Superficial Erosion.—In many persons, drinking very hot liquids causes an acute or dull burning sensation felt at the lower end of the sternum deep in the chest. This spreads laterally round the thorax and sometimes upwards into the root of the neck. It is a pain similar to that which occurs with established oesophagitis due to reflux of gastric contents in the presence of a hiatus hernia. In such a case hot liquids and solids may all cause a similar pain which is described as occurring as the food passes over what seems to the patient to be a "raw area" in the gullet. Such a sensation is not uncommon for a few days in a patient who has swallowed aspirin tablets the last thing at night; these may lie in the lower oesophagus and there produce a localized oesophagitis giving rise to a sensation of deeply situated pain in the chest with an exacerbation on swallowing.

Oesophageal Ulceration.—Deep ulceration as opposed to superficial oesophageal inflammation will produce similar pain, but often with radiation into the back, neck, head, and sometimes to the left ear. If, however, the ulcer penetrates into the laterally placed structures of the mediastinum—for example, the lung root—then the pain is felt laterally in the axillary region on the side which is involved.

Spontaneous Perforation of the Oesophagus.—When the oesophagus is torn by violent efforts to vomit and there is extravasation of oesophageal contents into the mediastinum and usually into the pleural cavity, a sudden and severe pain is felt in the lower chest and epigastrium and sometimes in the shoulder. The pain is intense, there is collapse and shock, the abdomen is found to be rigid, and a diagnosis of perforated intra-abdominal viscus is usually made and acted upon accordingly (Moynihan, 1954). The pain in this case originates in irritation of the lower mediastinal structures and the diaphragmatic pleura, and it is noteworthy that it is felt mainly in the epigastrium. Gas escapes into the mediastinal tissues and tracks upwards, producing subcutaneous emphysema over the root of the neck within a few hours of the initial acute episode (Barrett, 1946; Eliason and Welty, 1946).

Mediastinal Pleurisy and Emphysema

These conditions are not often recognized clinically. A patient who has experienced sudden and usually severe pain retrosternally with radiation into the neck and arms will say that the pain is made worse by taking a deep breath or coughing. Crepitations are heard near the sternum on auscultation, and these may be synchronous with the heart beat or with swallowing, and vary in number and intensity with alteration in the patient's posture. Frequently subcutaneous emphysema above the clavicles and suprasternal notch develops.

Chest x-ray examination will sometimes reveal air in the mediastinal tissues, especially in the lateral view, and invariably reveal subcutaneous emphysema when this is present.

Acute mediastinal emphysema associated with interstitial emphysema of the lungs may occur during a bout of coughing, on strenuous physical exertion, and sometimes in states of dehydration (Macklin and Macklin, 1944).

Case 13.—A man of 64 had been chesty for a few days with cough and fever. He suddenly developed a severe retrosternal pain in the upper part of his chest. The pain was sharp and tight and radiated up into the root of the neck to the level of the jaws; it also radiated into the left shoulder and upper part of the left arm. It was acutely aggravated by his trying to take a deep

breath, which was cut short as is characteristic with pleural pain. On examination showers of crepitations were heard over the manubrium sterni. No subcutaneous emphysema was found. The temperature did not exceed 99° F. (37.2° C.). An x-ray film of the chest showed a moderately enlarged heart. Three electrocardiograms showed no evidence of myocardial infarction or pericarditis. The pain and pleural signs rapidly disappeared on rest and antibiotic therapy. A similar attack occurred two months later; again there was no evidence of myocardial infarction, and the patient recovered on the same treatment.

In Case 13 the pain closely simulated the pain of myocardial infarction in character and distribution, but crepitations were heard over the sternum and the pain was clearly related to respiration, which suggested the correct diagnosis.

Case 14.—A youth of 19 experienced a sudden severe pain in the chest while heaving some bricks into a truck. He became breathless and distressed. The pain spread to the root of the neck and to both shoulders and arms. The classical signs of air in the mediastinum were found on his admission to hospital, and there was subcutaneous emphysema of the upper part of the chest wall (Hamman, 1939, 1945). The condition cleared up spontaneously in a few days.

Case 15.—A boy aged 14 had been unwell for some days. He developed moderately severe discomfort in his chest, situated retrosternally and without radiation; it was worse on breathing and on effort. On examination a loud pleuro-pericardial friction sound was heard over the front of the chest, and subcutaneous air was noted over the clavicles. He was found to be in diabetic pre-coma. A chest x-ray film showed the typical appearance of mediastinal emphysema with subpleural air separating the mediastinal parietal pleura from the mediastinal structures. There was no pneumothorax.

There is no doubt that in Case 15 the pain was caused by escape of air into the mediastinum, and it is likely that the severe central chest pain which is sometimes felt in spontaneous pneumothorax has a similar origin.

Spontaneous Pneumothorax

Occasionally it may be difficult to distinguish clinically between spontaneous pneumothorax and myocardial infarction. In the former, retrosternal pain may occur with radiation to the neck, jaw, and arms as in coronary occlusion. Possibly this is due in some cases to concomitant mediastinal emphysema, as mentioned previously. It is not only in cases of tension pneumothorax that this distribution of pain occurs, but sometimes in cases where the amount of air in the pleural cavity is small and is difficult to detect clinically. The following case is of this type.

Case 16.—A man of 30 experienced a sudden pain in the left side of his chest anteriorly while preparing his breakfast. It was not particularly severe at the time. He then started cycling to work, when the pain became more severe, was worse on deep respiration, and radiated to the left shoulder and base of the neck, making him breathless. He also noticed weakness, pallor, and coldness of the left arm and hand which lasted about an hour. When seen eleven hours after the onset of the trouble he was not distressed. The left chest wall moved slightly less than the right, and pleuro-pericardial friction sounds and a loud precordial systolic click were heard. A chest x-ray film revealed a small pneumothorax on the left side.

There is little doubt that air had escaped into the mediastinum as well as into the left pleural cavity. The transient pallor and coldness of the left arm was presumably due to arterial spasm, which may have been induced by air in the tissues surrounding the left subclavian artery.

Discussion

No attempt is made to consider the possible mechanisms of referred pain. It is evident that similar pain distributions can be produced by different pathological lesions involving the mediastinal tissues, but it seems that malignant growths in that region give rise more frequently to referral of pain to face and head than do other mediastinal lesions such as myocardial infarction. The whole clinical picture must of course be taken into account in diagnosis, and the value of radiographic and electrocardiographic study is obvious.

Not infrequently, however, it is only after watching the patient over a period of time that the cause of mediastinal pain becomes apparent.

Summary

A wider concept of mediastinal pain is suggested from the study of a number of clinical conditions.

The commoner causes of mediastinal pain are briefly discussed and illustrative cases quoted.

Similarities and differences in pain patterns are noted.

The value of a careful clinical approach is stressed and the use of special investigations indicated.

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A MILDLY AFFECTED FEMALE HAEMOPHILIAC

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Haemophilia, a disease controlled by a sex-linked recessive gene, is naturally very seldom encountered in women. There are a few well-authenticated female haemophilic patients; a family described by Merskey (1951) included three affected females, the daughters of a cousin marriage in a haemophilic family. Israëls, Lempert, and Gilbertson (1951) record another case, that of the daughter from the marriage of a haemophilic patient and a known carrier. In both of these instances later work has shown that the patients had classical haemophilia. In addition, it is occasionally found that female carriers of haemophilia have some unusual tendency to bleed (Fantl and Margolis, 1955); it is presumed that the abnormal gene is only partially recessive in these patients.

The girl whose case is described here is unusual because when first encountered she had no knowledge of any other affected member of the family. The case is worth recording because it illustrates features in the management of haemophilic bleeding.

Case Record

On July 7, 1956, a 19-years-old girl, who was dangerously ill with uncontrollable post-operative bleeding, was flown into the centre of Oxford by helicopter from Bournemouth and admitted to the Radcliffe Infirmary under the care of Professor L. J. Witts.

When the patient was 3 years old her mother and father separated and she was subsequently brought up by her father. On questioning she said that she knew of no other instances of abnormal bleeding in the family. Her childhood had been uneventful, and the only indications of an abnormal bleeding tendency were rather heavy periods and three weeks' bleeding from a tooth socket following extraction of a single tooth in her early teens. The bleeding