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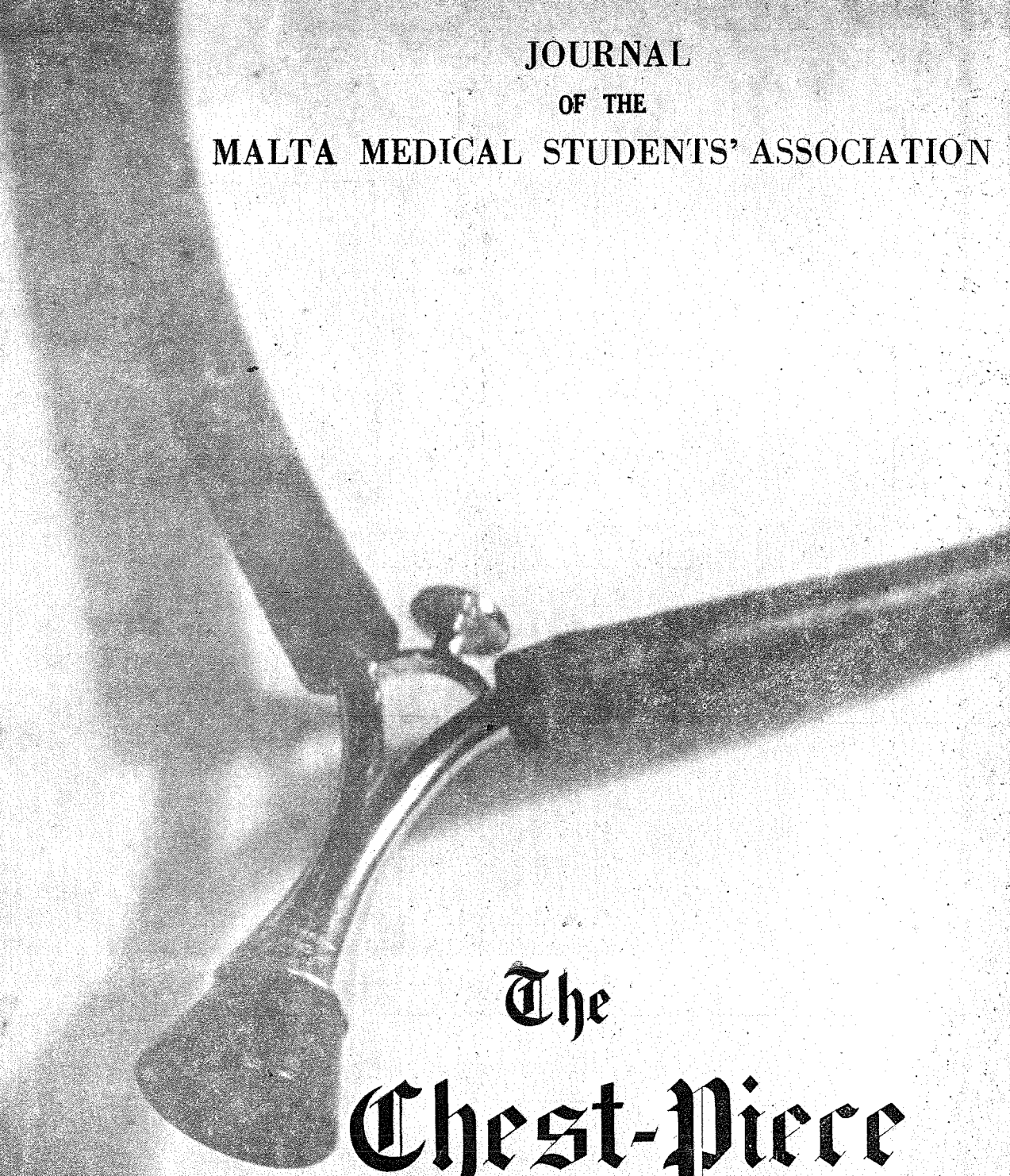

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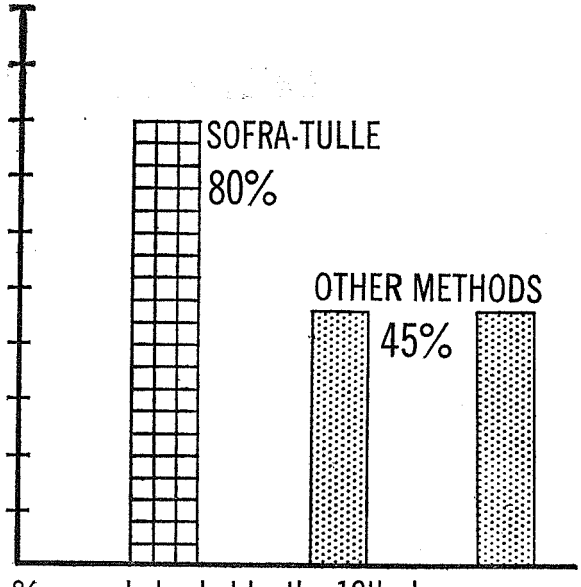

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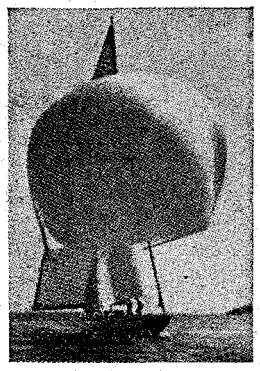

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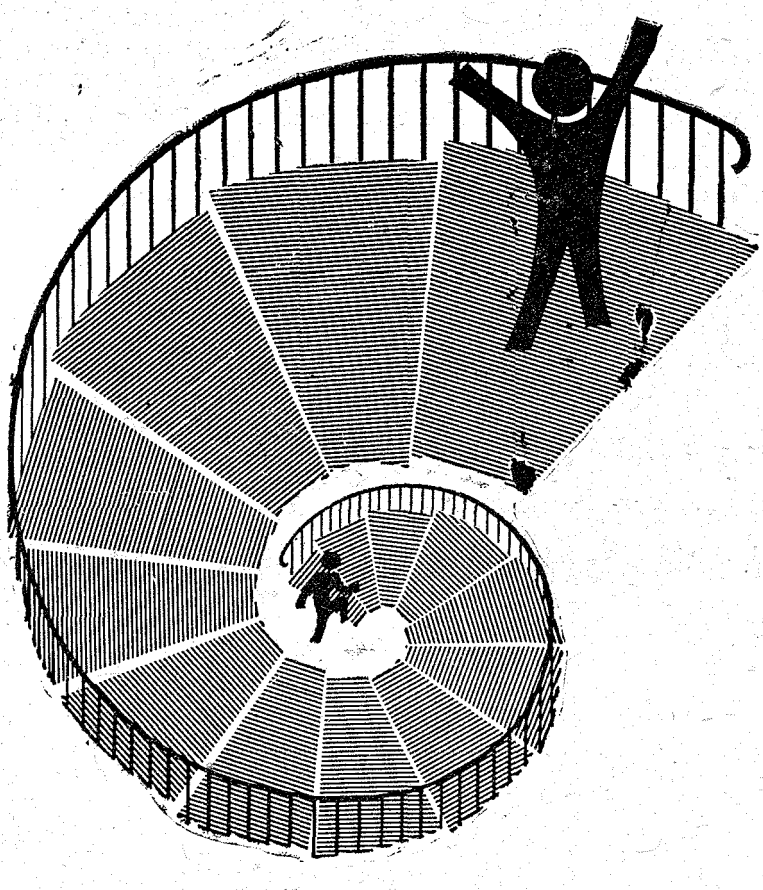

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EDITORIAL

M.M.S.A. INTERNATIONAL ACTIVITIES

During the past year, the M.M.S.A. has been very active in international relations. Beside increasing the number of clerkships, both incoming and outgoing, the council undertook a very difficult task, and in Dec.-Jan. 1963-64 the M.M.S.A. organised the 36th E.B.M./E.O.M. of the International Federation of Medical Student Associations in Malta. The conference was attended by over 40 delegates from 16 different countries. Most of the delegates were impressed how such a small association was able to organise such a big undertaking so successfully. Besides organising the meetings the M.M.S.A. also organised the social programme. The activities included a Welcome Party at the University, visits to Night Spots, a New Year's Eve Dance, a party given by Prof. J.V. Zammit Maempel M.D., M.R.C.P. (Lond.), Dean of the Faculty of Medicine and Surgery, sight-seeing in Malta and Gozo, a formal farewell dinner at the Hotel Phoenicia, and three other dinners.

In August 1964 , Dr. George Vella attended the XIIIth G.A. at Gdansk, Poland. At this meeting Malta was elected an Executive Board member of I.F.M.S.A., and we were entrusted with the Directorship of the I.F.M.S.A. Standing Committee on Liaison. Dr. Vella was appointed director temporarily, until the then forthcoming M.M.S.A. council elections, when Mr. Arthur G. Mercieca was elected as the Director. In December 1964-January 1965, Mr. A.G. Mercieca attended the Executive Board meeting and the Exchange Officers' meeting held at Stockholm. Beside being a member of the I.F.M.S.A. Executive Board, Mr. Mercieca was also appointed as a member of the I.F.M.S.A. Trust Fund Committee. In Stockholm many useful contacts were established.

Since then other important contacts have been established with Mexico, Jamaica, Belgium, Czechoslovakia, Uganda, Peru, Tanzania, and many other countries. Singapore and Ghana have applied for membership to the I.F.M.S.A. through the Standing Committee on Liaison.

OTHER I.F.M.S.A. ACTIVITIES

The M.M.S.A. will be participating in the Prevention of Blindness Campaign, organised by I.F.M.S.A. next November. The main work will be that of screening primary school children for Amblyopia. Students can be organised in teams of three, and each team will be in charge of a school of about 500 children. In this way it is hoped that it would be possible to screen children in about twenty schools. Other activities could take the form of publicity, broadcasts, and, with the help of the S.R.C., even fund raising, to aid the blind.

Other I.F.M.S.A. activities, in which it is hoped that Malta will be able to participate in the near future include a Blood Donation Week, an essay contest, the Drug Appeal, and research on Medical Education.

GREEK MEDICAL BELIEFS

"Nothing is more difficult than a beginning" wrote Byron of Poetry, and this remark fitly applies to my case, for although the material is abundant, indeed bountiful yet it is very difficult to sift what is really Greek from what has been borrowed by them from other cultures such as the Egyptian, Minoan and Assyrian. Contrary to what is held by many the medical knowledge of these people was relatively well developed, as can be seen from certain Egyptian papyri which described surgical procedures demanding considerable anatomical knowledge, and from that masterpiece of Assyrian art, "The Dying Lioness", originally found in the palace of Assurbanipal, depicting the lioness with a severed spinal cord from the arrows of her attackers crawling, dragging her paralysed hind limb behind.

The seeking of medical knowledge in a scientific way was however initiated by the Greeks, for the Assyrians, Egyptians and others sought it for religious practices; besides it was traditional with them that the doctor and the priest be one and the same person, while in the case of the Greeks they were two different persons with two distinct though not decidedly separate functions, for the gods had a great say in bringing about cures. The chief god of health was Zeus but there were many other subordinate gods who were very popular. The most important of the latter was Aesculapius whose special province was the conservation of physical health. He was said to be the son of Apollo and Coronide and was born according to Homer and Pindarus while his mother was being burnt by Apollo for having been unfaithful to him. Pausanius relates a different story: he says that the child was born in secret while Coronide was visiting the Peloponesian islands with her father Flegias, and abandoned him on the mountain Tithion where a goat fed him until a shepherd found him. Soon concludes Pausanius, it was known throughout the world that the child was able not only to cure all ills but also to resurrect the dead. He is represented with a serpent around a rod. His most important temple was at Epidaurus where the principle cure was the so called "incubatio" which consisted, after the patient had made a sacrificial offering and purified himself by bathing, in the so called abaton, a long colonnade open to the air on each side. During the sleep the god appeared to the patient and counselled the remedy or cured him. A stela of 300 B.C. fond at Epidaurus, undoubtedly done by the priests for propaganda purposes, had inscribed various healings, among which were:

Case 1: Kleo had been pregnant for 5 years. She slept in the sacred limits and when she came out gave birth to a child who immediately went to wash himself into the fountain and then walked away with his mother.

Case 15: Hermodikes of Lampskos was paralysed in body. In his sleep he was healed by the gods, who ordered him to bring to the temple as large a stone as he could when he left the abaton. The man grought the stone, which now lies before the abaton (and can still be seen to this day).

Case 3: Hereo of Militene had no hair; he slept in the abaton and during his sleep the god anointed his head and hair grew.

We will now take a look at some of the Greek medical theories which had such a great influence on the future development of medicine. The first Greek to begin constructing a positive

basis for medical science was Alcmaeon who lived around 500 B.C. as a native of the Greek colony of Croton in southern Italy. He was one of the first to use dissection of animals to obtain a scientific knowledge of the animal body. He discovered in the goat such things as the optic nerve and the Eustachian tube, which should therefore be more correctly named after him. He however gave to the Euctachian tube a repiraory function so that he is said to have taught that the goats inspired through their ears. He also did some sesearch on embryology, mostly of the chicken.

Very important for his great influence on later thought was Empedocles of Acregas, who lived in Sicily. He put forward the idea, no doubt obtained from folk belief that life is heat and blood is hot, of the innate heat which, he said, recides in the blood. We find this idea continually recurring in Greek thought; for example to one of the questions in the book of problems of Marcus Antonius Sanctipertias, "Why have beasts their hearts in the middle of their chest, and man his inclining to the left?" the answer is "To moderate the cold on that side due to the spleen". Also in Aristotle: "Why are beasts bold that have little hearts?" "Because in a little heart, the heat is well united and vehement, and the blood touching it doth quickly heat it, and is specially carried to the other parts of the body which give courage and boldness." The teachings of Empedocles also put forward the belief of the heart being the centre of the vascular system and also the chief organ of the pneuma, which was distributed to the body by means of the blood vessels. This pneuma was both life and soul, but it was something more. It was identical with air breath and of every psychic quality of the human individual; it was seen to rise as a shimmering stream from the shed blood of the sacrificial victim. This view that the heart was the main site of the pneuma was rejected by the Coan school (a group of medical writers who came into prominence in Western Asis Minor during the 5 century) whose works have since been fathered on Hippocrates of Cos.

The idea of the 4 humours corresponding to the 4 elements (Fire, Water, Earth and Aair, which make up non-living matter) was developed somewhat later around the 4th century. We find a good description of this theory in one of the treatises of the Hippocratic Corpus or Collection, namely "On The Nature Of Man". In it the author Polubus a son-in-law of Hippocrates, states that the body is constituted of the 4 elements blood, phlegm (pituita), black bile (melancholia) and yellow bile (chole) and that these are, both nominally and essentially, always the same and unchanging in youth as well as in age, in cold weather as well as in warm. He also adds that disease is produced as a result of abnormally heated, cooled, dried or moisted elements, or due to a separation of one element from the rest or to an excessive loss of an element outside the body. This history was further developed by Aristotle, who taught that there were 4 primary and opposite fundamental qualities, the hot and cold, the wet and the dry. These met in binary combination to constitute the 4 elements.

All the gross organs of the body were assigned specific functions, thus the lung is said to function as bellows fanning the heat in the heart; the spleen as the seat of melancholy, while the liver was the seat of love and the teeth were said to be sensitive as that they were capable of discerning heat and cold. The mind, however, was not given much importance by the Greeks generally speaking, although there were

some as Plato who in his Timaeus did indicate that it was the seat of thought and feeling.

Most of the importance was given to the heart which was said to be the principal organ and seat of intelligence, while the mind prevented the heart from becoming too overheated by secreting phlegm or pituita, the term being still used in modern nomenclature for the pituitary gland. For such ills as apoplexy, madness, headaches and migraine the serious surgical operation of trephining was performed; a good description of it is found in "Wounds of the Head".

Up to 1865 this operation was thought to have originated amongst one of the ancient cultures, but in that year a Dr. Prunieres of Marvejols found in a dolemen at Aigulères in Central France a neolithic skull bearing in the occipital region a large artificial opening with smooth edges. Dr. Prunieres thought that this skull had been used as a drinking cup, a common oractice among the prehistoric people, but further research by Prof. Broca in Paris on such skulls found in Britanny, showed that these were in fact skulls which showed that they had been trephined while the patient was alive, as the edge showed signs of healing. he skulls of these persons were very sought after on the death of the owner because parts of the skull, including parts of the trephined edge were cut and used as charms against madness and other mental diseases. A piece of the edge was however always left on the original skull to serve the owner as protection in the other world.

The anatomical knowledge of the Greeks was, before the advent of Aristotle, very rudimentary as can be understood from the treatise "On The Nature Of Man". The author describing the blood vessels in the body states that they consist of 4 pairs of a large calibre: one pair running from the back of the head through the neck, and weaving its way externally along the spine, passes into the legs and traverses the calves and the outer aspect of the ankle and reaches the feet. The second pair of blood vessels run from the head near the ears through the neck, where they are known as jugular veins. Thence they continue deeply close to the spine on either side. They pass close to the muscles of the lions, entering the testicles and the thighs. They then traverse the popliteal fossa on the medial side and passing through the claves lie on the inner aspect of the ankles and feet. The third pair of blood vessels run from the temples through the neck and under the shoulder blades. They then come together in the lungs; the right one crossing to the left and the left crossing to the right The right hand one proceeds from the lungs passes under the breast and enters the spleen and the kidneys. The left hand one proceeds to the right on leaving the lungs, passes under the breast and enters the liver and kidneys. Both vessels terminate in the anus. The fourth pair run from the front of the head and the eyes, down the neck and under the clavicles. They then course on the upper surface of the arms as far as the elbows, through the forearms into the wrists and so into the fingers. They then return from the fingers running through the ball of the thumb and forearms to the elbows where they course along the inferior surface of the arms to the axilla. Thence they pass superficially down the sides, one reaching the spleen and its fellow the liver. Thence they course over the belly and terminate in the pudendal area. In another treatise "The Sacred Disease", the author states that to the brain come many blood vessels most slender, but two stout. One of the stouter is said to come

from the liver while the other from the spleen. This may have been an erroneous substitution by the coypist at Alexandria, where the Hippocratic Collections were edited, for from the side of the liver and from the side of the spleen, but on the contrary it may just as well have been from the liver and from the spleen for they may have easily argued that love and melancholy, which had their seat in the liver and the spleen respectively, were carried to the brain by these vessels there mixed, bringing about moderation (coldness), which was the property ascribed to the brain.

Aristotle improved greatly on the anatomical knowledge of the time with his dissections, mainly of animals. He gave good descriptions of many organs including the male organs of generation. He also described the uterus, his nomenclature being more or less retained. Aristotle however, as all those before him and a good number after him, failed to differentiate between arteries and veins. He also believed that the vessels contained air besides blood. It was not until the time of Erasistratus of Alexandria, the father of physiology, that the distinction between the arteries and veins was understood and pointed out.

Besides the conventional subjects of medicine, the Greek medical men placed much importance on dreams; not so much as a means of fortelling the future, but as an indication of the functional state of the human body. In the Hippocratic Corpus we find a thesis on "Dreams", in which a meaning is given to the various things and situations of which one may dream. The author states that those dreams that merely consist of a transference to the night of a person's daytime actions and thoughts, which continue to happen in normal fashion just as they were done during the day, are good for they indicate a healthy state. On the contrary if the dreams are of a character contrary to day-time activity that is involving conflict or victory over them, then they constitute a sign of bodily distrubance in proportion to the seriousness of the conflict dreamt about. As a treatment the author prescribed a strong emetic for according to him the dream was due to an excretion resulting from some body superfluity. If a dreamer dreamt of escaping in fright from anything, this meant failure of the circulation as a result of dehydraion. As a treatment for this cooling and moistening of the body was counseled. Again, if in a dream it seemed to rain with gentle rain from clear skies and without any violent downpour or heavy storm, it was good for it indicated that the breath drawn from the air was proportioned and pure. If the reverse happened, i.e. violent rain, stream and tempest, and the rain is not clear, it indicated the onset of a disease causedu by the respired air.

The art of physiognomy although not, strictly speaking concerned with medicine, was in that time taught as part of the medical education. They believed that the development of everybody's character was influenced by the twelve signs of the Zodiac, which was in turn reflected in the physical features of the individual. Thus in Aristotle's Physiognomonica, the author notes that when a man has a large forehead he is slow to move; straight eyebrows are a sign of softness of disposition, and such as curve towards the nose are of a harsh disposition; such as curve towards the temples are a sign of humour and dissimulation, while those eyebrows that are drawn in towards one another are indicative of a jealous disposition. Of the eyes, he says that when the commissures are long, they are a sign of bad disposition and

if the side towards the nostril be fleshy and comb-like they are a sign of dishonesty, while he who hath a wondering eye, and which is rolling up and down, is for the most part a vain, deceitful, lustful, treacherous or high-minded man, an admirer of the fair sex and one easy to be persuaded to virture or vice.

From this swift and cursive analyses of Greek medical thinking, one may note that although medical knowledge did advance in their times, most of it was speculative and not corroborated by any experiments. Indeed the experiments and dissections were all, excluding those of Aristotle, very badly done and impossible conclusions were drawn from them, as in the case of the author of "On The Head", who states that from experiments he had come to the conclusion, very evtraordinary to our modern ideas that some of the fluid one drinks passes to the lungs. To my idea the most important think the Greeks did in the medical field was to remove medicine from the bigoted atmosphere of the religious functions and to elevate it to the state of a science from where it could advance with relatively steady steps, to our present position

Wilfried P. Cassar-Demajo

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Foetal Hazards from Maternal Therapy in Late Pregnancy

By Arthur P. Camilleri M.D., M.R.C.O.G., M.M.S.A., D.C.H.,
Lecturer in Obstetrics & Gynaecology, Royal University of Malta.

It has long been known that drugs given to a pregnant woman for therapeutic purposes may cross from the maternal to the foetal circulation. Very few do not. Page (1957) has studied the possible ways in which drugs and other substances can cross the so-called "placental barrier"; and the passage of drugs across the placenta is extensively reviewed by Moya and Thorndike (1962) and by Hagerman and Villee (1960). In fact the tissues of the placenta are very active metabolically and it is difficult to understand how this concept of a "barrier" between the maternal and foetal circulations was sustained — on this score the efficiency of the placenta is minimal (Villee, 1960).

A considerable amount of work in experimental animals has repeatedly demonstrated that various drugs given during pregnancy can result in foetal malformations and disease. Experimental teratogenesis in mammals probably dates from the discovery by the American veterinarian Hale (1933), that deficiecy of Vitamin A in the diet of pregnant sows resulted in the birth of piglets without eye-balls. Thirty years lapsed by, yet the subject never seemed to arouse much interest in clinicians. It required the Thalidomide Disaster of international extent to stir up concern and activity.

To-day many clinicians are on the alert for the detection of possible associations between drugs administered to pregnant mothers and the appearance of congenital deformities in their offspring. Many pharmaceutical firms are known to be carrying out a systematic check on all their drugs for teratogenic properties. Meanwhile, the extra caution to be exercised before prescribing *any* drug to a pregnant woman has been emphasized several times recently (Dent *et al.*, 1962), especially since the problem of assessing the dangers of a particular drug to the human embryo is beset with difficulties (Lancet, 1963 a). The action of drgus on the embryo was discussed recently in the Section of Experimental Medicine of the Royal Society of Medicine ,Woollam *et al.*, 1963).

Teratogenicity, however, is not the entire story. Nor is it true that the drug-induced hazards for the foetus are confined to the first two or three months of its intra-uterine life.

As a result of certain drugs given to the mother late in pregnancy or during labour, the human foetus faces the risk, not of congenital malformations, but of death or disease.

These are real hazards. Yet it is not unlikely that their existence and importance are not adequately realized. This is all the more unfortunate in view of the fact that the resultant neonatal complication can, in most cases, be foreseen and even prevented.

The purpose of this paper is to review the drugs which may seriously harm the foetus if administered to the mother late in pregnancy or during labour.

Synthetic Vitamin K. It has been shown that Synkavit and other water-soluble analogues of vitamin K can produce neonatal jaundice (Nyhan, 1961). This is primarily due to increased hae-

molysis of the red blood cells. The infant will suffer from haemolytic anaemia, and the resultant hyperbilirubinaemia exposes him to the dreaded risk of kernicterus. This hazard is greater if the baby is premature.

Vitamin K can cross the placenta, and large doses given to the mother before delivery will raise the risk of severe jaundice in the newborn (Lucey and Dolan, 1959). The danger of kernicterus is so real that many of these infants require treatment by exchange transfusion soon after birth.

If the obstetrician or midwife feels that the administration of vitamin K is indicated in a particular labour, then the practice to-day is to avoid giving big doses: 1mg if given to the baby, and 5mg to 10 mg if given to the mother in labour.

Sulphonamides and Related Drugs. Here again there is the danger of kernicterus, particularly in the premature baby. This toxic effect was first observed clinically by Silverman and co-workers (1956) in relation to sulphafurazole (Gantrisin); other sulphonamides have been shown to be equally harmful. These compounds displace bilirubin from its albumin bond in the plasma. There is a consequent rise in the amount of free bilirubin, which diffuses readily into the tissues, including the brain — and kernicterus sets in.

Most of the sulphonamides have been shown to cross the placenta: within three hours the concentration of these drugs in the foetal blood equals that in the maternal blood, and may then exceed it. Indeed, two of the long-acting sulphonamides (which are marketed as Lederkyn, Madribon and Midicel), when administered to women in labour, may persist in their infants' blood for four to six days after birth (Lucey and Driscoll, 1959).

In such circumstances these long-acting sulphonamides may carry a greater hazard for the baby about to be born, on account of their persistence in the infant and their tendency to bind more securely to plasma proteins than the shorter-acting sulphonamides (Newbould and Kilpatrick, 1960).

It would seem prudent to avoid the use of sulphonamides during labour, especially the long-acting compounds. This is particularly true in cases of premature labour.

Ward (1963) points out that a number of other drugs carry the same risk of crossing the placenta and producing hyperbilirubinaemia in the newborn if used close to term. Phenothiazine drugs and phenylbutazone are two examples.

Chloramphenicol. There have been no reports of foetal damage from the use of chloramphenicol in the parturient mother, but there are certainly some grounds for sounding a word of warning. It is probably very fortunate that this drug has had little therapeutic indication in the treatment of infections associated with late pregnancy or labour.

Chloramphenicol is normally detoxified in the liver, mostly by glucuronide conjugation. In the newborn, however, all the functions of the liver are relatively inefficient: this includes the ability to form glucuronides. Consequently chloramphenicol is only slowly metabolized by the liver of the normal newborn infant. The premature infant and the foetus must be even less capable of handling this drug by conjugation and detoxification in the liver. The excretion of the drug by the kidney is also slower than in the adult.

Ordinary dosage may thus result in unduly high blood levels, and toxic effects will be produced. The administration of chloramphenicol to newborn infants has caused severe collapse (the "gray syndrome"), and even death (Weiss *et al.*, 1960).

While it is true that the effect that

chloramphenicol may have on the foetus is still unknown, yet present knowledge would suggest a distinct possibility of severe toxicity.

Tetracyclines. The major toxic effects of tetracyclines group of drugs are only recently coming to be recognized (Lancet, 1963b). Most writers on this subject find no difference in toxicity between the various tetracyclines.

All this group of antibiotics crosses the placenta readily, and they are rapidly taken up by growing bones and teeth. An impressive case is described by Bennet (1963), illustrating the rapidity with which tetracyclines become fixed in foetal bone after passing from the maternal circulation: the mother had not had more than 1.5g of tetracycline, all within 18 hours of parturition.

One effect of maternal therapy with these antibiotics is that they tend to produce yellow staining of the infant's deciduous teeth. This deposit in the dentine may interfere with the development of the tooth and with enamel formation.

A more alarming possibility is that, given late in pregnancy, tetracycline may become rapidly deposited throughout the skeleton of the foetus. This would interfere considerably with the growth and development of the foetal bones.

There is no doubt that tetracyclines are not without serious hazards when given to pregnant women.

Streptomycin. It is probably true to say that the chances of encountering a toxic effect in the foetus of a mother who has been given streptomycin are smaller than the general incidence of toxicity from this drug.

Streptomycin and dihydrostreptomycin both cross the placenta. If the maternal dose is adequate they may reach bacteriostatic levels in the foetal blood.

Friend (1963) says that isolated cases of damage to the eighth cranial nerve have been reported; one child was found to be deaf at 2½ months of age. Kern (1962) has collected four such cases, and he believes that these two drugs should not be used in pregnancy.

Ganglion-blocking Drugs. These agents are widely used in the treatment of hypertension and toxaemia of pregnancy. They readily cross the placenta: when injected into the mother, they may appear within two minutes in the foetal blood. Autonomic activity in the foetus may then be disturbed.

Morris (1953) recorded two fatal cases of paralytic ileus and one of delayed passage of meconium in the newborn babies of mothers who had been given a hexamethonium compound during pregnancy.

The danger of inducing ileus in the newborn is almost certainly present with all ganglion-blocking drugs. On the other hand the risk is practically abolished if the drugs are discontinued five to seven days before the expected date of confinement.

Wilson (1962) has drawn attention to a recently recognized drug-induced complication in newborn babies whose mothers were treated with reserpine (Serpasil) for toxaemia up to two days before delivery. The infant's nasal mucous membrane, unusually responsive to reserpine, becomes oedematous. This may give rise to a non-infective discharge or even nasal obstruction. The condition usually clears up in less than a week, but it may cause embarassment to the infant and require prompt treatment with decongestant nose-drops.

Sympathomimetic Amines. These drugs can jeopardize the foetus if they are given to the mother in labour. They should be avoided if there is the least suspicion of placental insufficiency or foetal distress.

The injection of these amines into

the maternal circulation during labour may produce anoxic effects on the foetus. This has been shown to be the direct result of their vasoconstrictive action on the uterine vessels (Beard, 1962). Probably they do not appreciably reach the foetal circulation, because they are inactivated by the placental enzymes. Outside labour it appears that the foetus is less sensitive than the mother to the pressor action of these amines.

Anticoagulants. Anticoagulants therapy is to-day considered to be indicated during pregnancy in cases of phlebothrombosis and of pulmonary embolism. Francis (1963) points out that the choice of anticoagulant drugs in pregnancy is restricted by the small molecular size of the coumarin derivatives.

Pregnant cows fed on contaminated sweet clover may have calves with the typical haemorrhagic lesions of coumarin poisoning. In the human, Dicoumarol and related derivatives cross the placenta with ease, and very often the foetus dies *in utero* or sometimes in the neonatal period. The case of the twin pregnancy described by Gordon and Dean (1955) is typical: The anticoagulant was stopped one week before delivery, yet the first twin was stillborn and the second died on the thirtheenth day with extensive haemorrhages.

Dicoumarol is too dangerous to be used in pregnancy. Heparin is safer for two reasons. Its molecule is too large to cross the placenta. Used intravenously, its duration of action is less than the length of all but precipitate labours. There has been no report of an effect on the foetus from heparin given to the mother.

Analgesics, Sedatives, Anaesthetics. This composite group of drugs is used extensively in labour. It has undoubtedly achieved a great deal in relieving the pain of parturition and in facilitating obstetric manoeuvres.

The majority of these drugs cross the placenta readily, and harmful effects on the foetus are not uncommon. The only notable exception is the muscle-relaxant succinylcholine, which crosses only in small amounts and does not appear to affect the foetus (Stead, 1955).

There is no need to enlist the agents used in obstetric analgesia and anaesthesia; it is well known that they often cause respiratory depression in the newborn. Thus, morphine and its derivatives readily cross the placenta, and so does pethidine; fortunately either drug has a highly specific antidote, which rapidly improves the infant's condition if its respiratory depression is due to the analgesic drug.

In connection with morphine and pethidine there is a further associated danger that is very important. Several observers have found the mono-amine oxidase inhibitors (Marsalid, Nardil, Niamid, Marplan) to exert a highly potentiating effect on the action of pethidine and morphine. The manufacturers of these new drugs warn that morphine and pethidine are contra-indicated not only while their drugs are being taken but also for a fortnight after stopping them. These agents, therefore, should not be prescribed after the 38th week of pregnancy in view of the the fact that morphine and pethidine are so commonly used during labour.

An interesting study by Brazelton (1961) showed that heavy barbiturate premedication of the mother in labour could render the neonate rather drowsy for some days and might impair his ability to establish adequate breast-feeding. A similar picture may be expected in the case of an epileptic mother receiving high doses of phenobarbitone and phenytoin right up to the day of confinement.

Conclusion. It is evident that many forms of maternal therapy in late pregnancy or labour may constitute a very real danger to the foetus soon to be born. Indeed, it may well be that several serious risks are awaiting to be discovered and recorded. It is the duty of the doctor or midwife, not merely to avoid prescribing drugs that are known to create an early neonatal hazard, but constantly to observe and study the possibility of disease in the infants of mothers who have received any drugs during pregnancy or labour.

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Conductive Deafness—
ITS SURGICAL TREATMENT

by

W.A. Sultana, M.D., B.Sc., D.L.O., F.I.C.S.

When the antibiotics were first discovered, many thought that the end of aural surgery was near. At that time, the bulk of the surgery was done for acute infection, chiefly acute mastoiditis. Chronic disease of the ear, especially chronic suppurative otitis media, with or without mastoiditis, was also common, and mastoidectomies (radical or non-radical) appeared on almost all operating lists. In fact these operations were performed almost as frequently as tonsillectomies

The antibiotics have reduced the dangers of an acute otitis media to such an extent that a cortical mastoidectomy is rarely necessary. Surgery for chronic disease is still undertaken, but a change in technique has modified present concepts, as we shall discuss later on.

Aural surgery, far from losing its importance, has progressed so much as to produce specialists within the Speciality. Not all otolaryngologists are aural surgeons. The latter require more training and greater surgical skill. In days gone by the surgery was directed against infection, and the patient, although cured, was usually left either totally deaf or with impaired hearing. Little attention was paid to function, while today normal or near-normal hearing is the goal of ear operations. This change was brought about, ironically enough, by the anti-biotics, as well as by better means of sterilization. While previously a labyrinthitis almost invariably meant a fatal meningitis, today surgeons are not afraid to approach the labyrinth, and openings into it are an everyday occurence.

The operating miscroscope and better instruments were other factors responsible for the change.

Broadly speaking, aural surgery for deafness tries to repair some defect in the conducting mechanism of the middle ear which is either due to otosclerosis or is the result of infection.

In otosclerosis, new spongy bone develops in the capsule of the labyrinth, replacing the old bone and extending into the footplate of the stapes, thereby interfering with the normal function of the stapedovestibular joint. The disease is progressive and usually bilateral.

During the last century attempts to restore hearing by operation were many but failures were so frequent that leading authorities advised against surgery.

In 1945, Julius Lempert of New York perfected the technique of the fenestration operation. He replaced the oval window, which was blocked by the disease, by a new 'fenestra' in the external semicircular canal. The operation, therefore, short-circuited the ossicular chain and sound waves reached the labyrinth directly through the new opening. The results of the operation were extremely good and for 15 years no other technique was attempted.

The main objections to the fenestration operation were that only a limited number of otosclerotics were suitable, and that a cavity was produced in the mastoid process which required regular attention, and in some patients discharged continuously. Moreover, the operation, however successful, could never produce normal hearing.

The fenestration operation for otosclerosis is now obsolete, but there are thousands of patients all over the world who owe their hearing to Lempert and his successors.

The next operation to be developed was Mobilisation of the stapes. The technique was perfected by Samuel Rosen also of New York. The operation was more logical than fenestration because it aimed at curing the patient by using the natural means of hearing — the drum and the ossicular chain.

Briefly the technique is as follows: An incision is made in the external auditory meatus and the soft tissues are elevated together with the drum. They are displaced forwards and the contents of the middle ear examined. When the otosclerotic focus is small, pressure on the neck of the stapes may break the focus and mobilisation is complete. This is a rare occurence and is known as Indirect Mobilisation. In the majority of cases, the stapes has to be mobilised directly by exerting pressure on the footplate itself. The operating microscope is of course used for all these stages.

The success of this operation ,which is usually done under a local anaesthetic, is very dramatic. Well over 80% of the cases we operated by this technique regained their hearing on the operating table. Little trauma is done and the patient remains in hospital for only 24 hours. No prophylactic antibiotics are given and complications are rare.

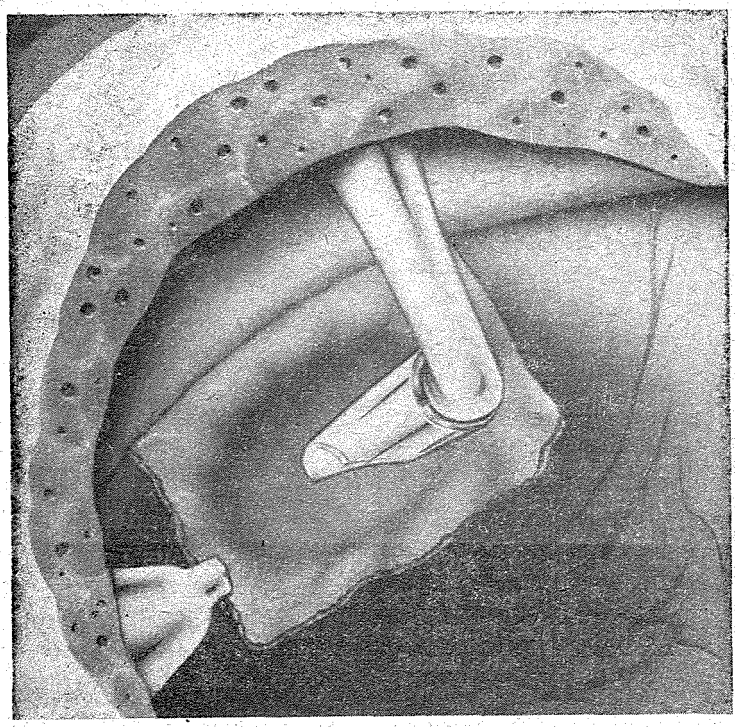

Fig. 1
STAPEDECTOMY. J. Shea's technique using vein graft and polyethelene tube.

The objection to mobilisation of the stapes is that the improvement in hearing is often temporary. Only 20% of the successful cases keep their gain after 18 months.

The general opinion today is that if

the gain in hearing is to be permanent, the stapes must be taken away — Stapedectomy. Naturally, this will disrupt the ossicular chain and, therefore, a link from the incus to the vestibular opening has to be made. At present there are 3 ways of effecting this:

1. Shea's method: The vestibular opening is covered by a vein graft and a polyethelene tube bridges the gap between the graft and the incus.

ed between the articular surfaces of the stapedovestibular joint. This principle is often used in orthopaedic surgery.

Opinion is divided as to which of these techniques is the best. They all give excellent and spectacular results and are suitable for all patients with otosclerosis, however deaf. We have tried all three methods and find the Schuknecht technique preferable. Interposition is the most difficult.

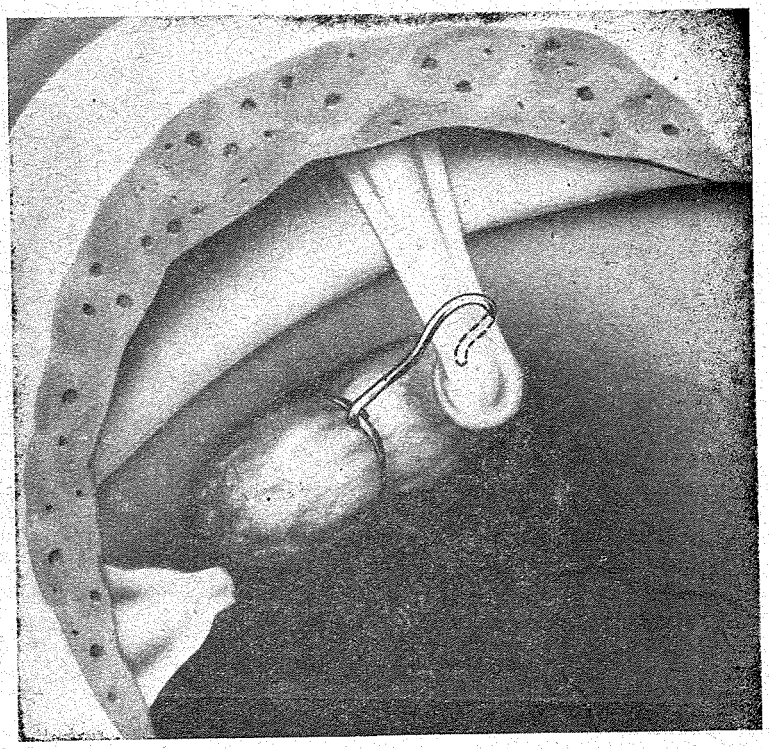

Fig. 2.
STAPEDECTOMY. The Schuknecht operation with fat plug and stainless steel wire.

2. Schuknecht's technique: The vestibular opening is closed by a plug of fat around which stainless steel wire has been tied; the end of the wire is anchored to the incus.

3. Portmann's Interposition: The vestibular opening is closed by a vein graft and the original stapes is replaced upon it. In other words, the graft is interpos-

Like other operations on the internal ear, total deafness may result, but this is a rare occurence. We have only had one case in the past 7 years, and the deafness came on about 3 weeks after operation following an attack on influenza.

Infection is another complication which should, however, respond to anti-

biotics. Nowadays we prefer to use these drugs prophylactically and to continue them for one week after operation.

The other operations on the ear are intended to combat a chronic infection and at the same time repair the damage that has resulted from it. These are the TYMPANOPLASTIES, and, in the main, owe their evolution to the German School of otologists. The names of Zöllner and Wullstein stand out amongst these. They applied well known physiological principles to surgery, and the results of these operations, when successful, are of benefit to the patient and gratifying to the surgeon.

There are 5 types of tympanoplasty according to the extent of disease and the damage that it has produced.

When the infection is quiescent and the contents of the middle ear are whole but are not functioning properly due to a perforation in the drum, a type I tympanoplasty can be done. The procedure is also known as Myringoplasty, and consists in the closure of the perforation by a graft. The material used for the graft varies with individual surgeons. We have used whole-thickness and split-skin grafts, vein and connective tisue, and find that the best is fascial graft taken from the temporal muscle. This almost invariably 'takes', and for the past 6 months we have not had one failure.

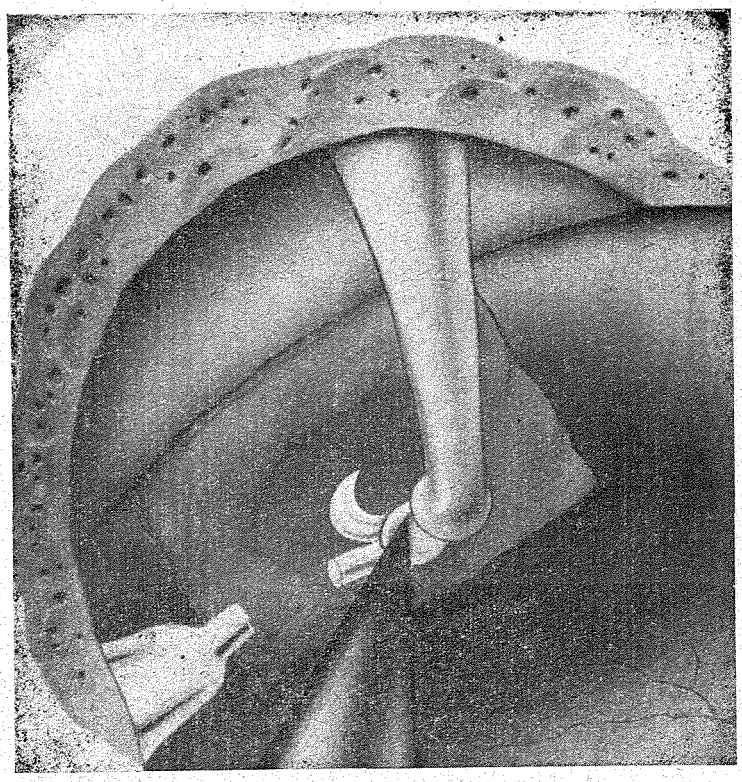

Fig. 3.
INTERPOSITION. The appearance of the middle ear at the end of the operation. A vein graft has been interposed between the remains of the stapes and the vestibular opening.

When a small cholesteatoma has eroded bone and disrupted the ossicular chain, a type II tympanoplasty has to

be done. Sound waves reaching the drum are transmitted to the internal ear via the malleus, incus and stapes, and when one or a part of these ossicles is eroded by disease, the so-called columella effect is lost. The chain must therefore be repaired. This is effected either by ossicular transposition or by bridging the gap in the chain by bone grafts or by artificial prosthesis. Results in this type are also good.

If fter removal of diseased bone, and possibly also of a large cholesteatoma, one finds the middle ear contents to be almost entirely missing a type III, type IV or type V tympanoplasty has to be done. Results in these types are not so good with regard to hearing. The technique is difficult and type V entails also a fenestration of the lateral semicircular canal, because the stapes is absent and the footplate ankylosed in the oval window niche. In fact ,if the post-operative hearing level remains the same as it was pre-operatively, the result is considered good.

SUMMARY

A brief description of the surgery of deafness has been given. Most of the operations are specialised and demand careful preparation before they are undertaken. Medical treatment should be tried in all cases before surgery is considered. The results of these operations are good, but there will clearly be improvements in the future. Although the advance in the last 10 to 15 years has been great, one cannot see that this will continue to be so unless more knowledge is gained about the character of the disease; this is especially true of otosclerosis.

THE VALUE OF PULMONARY FUNCTION TESTS IN RESPIRATORY DISEASES

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Physicians treating patients with respiratory diseases have come to realise the importance of estimating the functional disorder in their patients in addition to elucidating the morbid changes and the aetiology of the disease. This attitude is very similar to that adopted in relation to cardiac and renal disease where knowledge of the functional state is so essential from the point of view of treatment and prognosis. Respiratory function tests are used in clinical practice for two main purposes, one to aid diagnosis and the other to estimate the degree of functional disability in assessing progress and the results of treatment.

The functions of the lung can be conveniently divided into:

a. Ventilatory
b. Diffusion
c. Circulatory.

Any one or more of these functions may be disordered in a particular patient. The objective of those tests is the assessment of all phases of the function of the lungs. Various tests are available, however the diagnostic interpretation of some of them is complex. The simplest test consists of exercising the patient. It is a rough test and it does not differentiate respiratory from other disorders, however it may be very useful in assessing progress. Measurement of the chest circumference and the degree of chest expansion is only of value in diseases of the thoracic cage or musculature such as ankylosing spondylitis and poliomyelitis.

Ventilation

Ventilation is concerned with the transport of gas between the atmosphere and the alveoli. Assessment of ventilatory function entails the measurement of both the amount of air that the patient can take into his lungs and the speed of expiration. Tests of pulmonary ventilation can be easily performed with a close-circuit spirometer. In clinical practice, the following determinations are required: the vital capacity, the forced expiratory volume at one second ($F.E.V._1$) and the maximum voluntary ventilation (M.V.V.); one need not estimate the various subdivisions of the lung such as inspiratory capacity, functional residual volume and the residual volume. One should always be able to analyse the spirographic tracing and look for evidence of air-trapping which is so common in emphysema. Air-trapping occurs during the expiratory phase, the air is literally trapped behind the obstruction as loss of normal parenchymal elastic recoil results in expiratory 'check-valve' closure of loosely supported bronchioles. The $F.E.V._1$ is in fact the timed vital capacity. It is carried out by making the patient expire as much and as fast as he can into a spirometer to which is attached an electronically controlled timing device. The portion of the total vital capacity. the $F.E.V._1$ for an average adult cond is determined and expressed as a percentage of the total vital capacity. The F.E.V. 1 for an average adult male is about 3,600 ml or 80% of vital capacity. The maximum voluntary

ventilation can be defined as the maximum amount of air that can be ventilated per minute. This test is usually carried out over a period of 15 seconds and the result that would ensue for a minute can be calculated from this. The M.V.V. can be calculated indirectly from the F.E.V.$_1$ by multiplying this by 40. The M.V.V. for an adult male averages about 130 litres per minute. The degree of air-way obstruction can be estimated readily by doing the F.E.V.$_1$ which is reduced in such cases or more simply but with less accuracy by the Wright Peak Flowmeter which measures the maximum velocity of air attained when the patient is asked to blow as fast and as hard as he could into the flowmeter (normal-600 litres/minute). The Peak Flowmeter is very suitable for outpatient use. However, the F.E.V.$_1$ is the most instructive and useful test in common use today.

The best indication of the adequacy of ventilation is the level of the alveolar carbon dioxide tension as this is dependent only on the rate of elimination of CO_2 and the alveolar ventilation. A rise of the alveolar pCO_2 above 38 mm Hg indicates that there is hypoventilation. The alveolar pCO_2 can be easily measured by the rebreathing method described by Campbell and Howell. This test can be carried out in the ward and all that you require is a rebreathing bag and a Haldane pCO_2 analyser.

These ventilatory tests will provide valuable information. They will indicate whether ventilation is disturbed and whether the defect is obstructive e.g. emphysema, bronchial asthma, chronic bronchitis, or restrictive in nature such as the alveolar-capillary block syndrome (stiff lung syndrome). Included in the alveolar-capillary block syndrome are such conditions as sarcoilosis, scleroderma, Hamman-Rich syndrome, idiopathic pulmonary haemosiderosis, post-irradiation fibrosis, Histiocytosis X and lymphangitis carcinomatosa. In obstructive conditions, the F.E.V.$_1$ and the M.V.V. are shown to be relatively much more impaired than the vital capacity; whilst in restrictive lesions, the vital capacity is much reduced with proportionately smaller decrease in the F.E.V.$_1$ or M.V.V. Used serially, they will show whether ventilation is improving or becoming worse and the value of drugs in such conditions as bronchial asthma can be assessed. In respiratory failure due to ventilatory impairment the alveolar pCO_2 is found to be raised whilst in that secondary to alveolar-capillary block the alveolar pCO_2 is normal or slightly lowered.

In some instances especially where pulmonary surgery is being contemplated, it may be desirable to determine the functional status of the lungs separately. Such studies will enable the physician to advise the surgeon whether the contemplated operation is liable to turn the patient into a respiratory cripple or not. Bronchospirometry involves the independent measurement of the vital capacity of the individual lungs or even lobes. For this type of study, a double lumen catheter is introduced into the trachea. The two lumens are of different lengths, one being placed in the main left bronchus whilst the shorter one remains in the trachea. This permits the ventilation of each lung to be separate and which can thus be easily measured with a double spirometer. Bronchospirometry may be rendered obsolete by the use of radioactive oxygen as this allows regional lung function studies to be carried out without the need for intubation.

Diffusion.

Studies of the diffusing capacity of the lung is essentially the study of the

levels of oxygen in the blood and its relation to the alveolar pCO_2. Arterial unsaturation may be caused both by ventilatory defects and diffusing defects. Anything that reduces the total surface area available for diffusion will reduce the diffusing capacity of the lungs. Pneumonectomy, recurrent pulmonary emboli and obstructive emphysema all reduce the diffusing capacity of the lungs. Increase in thickness of the tissues of the alveolar-capillary membrane will also reduce the diffusing capacity. There is a group of diseses which affect primarily this membrane and they can all be grouped together under the syndrome of alveolar-capillary block. Their primary effect on pulmonary function is blocking the diffusion of oxygen from the alveoli into the pulmonary capillaries. The diseases which are included in this syndrome have already been mentioned when discussing ventilation. The diffusing capacity of the lungs can be measured with ease, however the equipment required is expensive. The Single Breath Method using carbon monoxide is usually used. This method consists in inspiring a small concentration of CO, holding the breath for 10 seconds, and then expiring; by determining the concentration of CO in the alveoli and in the expired air the consumption of CO is obtained. The diffusing capacity for CO is calculated from the mean alveolar concentration of CO and the amount of CO utilised. The diffusing capacity for CO is about 17ml of CO per minute per mm Hg. This may go up to 60ml of CO per minute per mm Hg. with exercise. By multiplying the diffusion capacity for CO by 1.23, one will obtain the diffusing capacity for oxygen. Impairment of the diffusing capacity should be strongly suspected if arterial oxygen saturation falls considerably on exercise in the absence of veno-arterial shunt. The inhalation of 100% oxygen corrects the arterial saturation completely in diffusion defects but only partially in cases of veno-arterial shunts. The alveolar pCO_2 in these diffusion defects is either normal or low. Estimation of arterial oxygen saturation involves arterial puncture and the use of an oximeter.

Perfusion

Studies of the perfusion zone of the lungs consists essentially in the measurement of flow and pressure in the pulmonary circulation. The Fick principle is made use of to measure the amount of blood flow through the lungs. Pulmonary hypertension can be suspected clinically by finding a big 'a' wave in the jugular venous pulse, a left sided parasternal heave and a loud pulmonary second sound. Tall P waves in V_1 and V_2 and right ventricular preponderance in the E.C.G. are very suggestive. However pulmonary pressure can only be confirmed by direct measurement through a cardiac catheter.

Though these tests need not be carried out routinely in all patients suffering from respiratory disease, there is no doubt that when they are used judiciously, they may yield information of vital diagnostic and prognostic importance. In clinical practice, limited studies of pulmonary function, especially ventilatory function studies, are usually sufficient. However in some cases, various investigations testing particular aspects of pulmonary function may have to be carried out.

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Post-Menopasual Bleeding

By Edwin S. Grech M.D., B. Pharm., D.(Obst.) R.C.O.G., M.R.C.O.G.

The term post-menopasual bleeding implies a resumption of uterine bleeding after the last menstruation. This time limit, however is arbitrary, and some authors prefer to reduce the period to 6 months. Although post-menopasual bleeding has specific reference to bleeding from the uterus, the term is widely used to include other sources.

Bleeding occuring after the menopause is even much more sinister than irregular pre-menopasual bleeding. All the authors agree that vaginal bleeding after the termination of the normal menstrual life of a woman is a symptom calling for serious consideration. Experience has taught us that the underlying pathological condition is often some form of malignancy. Te Linde (1930) says that so firmly has this idea been fixed in our minds, that we are prone to forget that, fortunately, not a few benign pelvic conditions may be responsible for this symptom.

It can be seen from table (I) that more recently reported series reveal a lower incidence of genital malignancy. This probably does not reflect a decrease in malignancy but rather a great awareness of the significance of post-menopasual bleeding with consequent increase of such patients hospitalized for diagnosis. Although the incidence of post-menopasual bleeding due to malignancy is now approximately one half that of 25 years ago, it remains sufficiently high to require complete investigation.

Table 1. Incidence per cent of Pathological Conditions

Authors	Malignant	Benign	Unknown
Te Linde (1930)	60	40	—
Brewer & Miller (1954)	27.5	34.1	38.4
Jones & Mahoney (1957)	30	70	—
Payne et al. (1959)	30	58	12
Personal series	23.8	47.6	28.5

I followed a whole year's admissions into the gynaecological wards of a large general hospital. There were 1,369 patients admitted; 63 of these were for investigation of post-menopasual bleeding, showing an incidence of 4.6% of the total number of admissions. Malignancy was found in 15 cases, an incidence of 23.4% or 1.2% of the total admissions. The arbitrary time limit of amenorrhoea was taken as 6 months or more.

The character of the bleeding varied in degree from spotting or scanty flow to moderate, profuse or gushing. Spotting and scanty flow are the most frequent types whether the lesion is benign or malignant. Brewer and Miller (1954) noticed that gushing was approximately 4 times as frequent in patients with uterine malignancies. However, neither the character nor the duration of the bleeding reflect the clinical extent of the pathological lesion.

Aetiology

The possible causes of post-menopausal bleeding will now be discussed. Except for the senile states they apply equally to pre-menopausal bleeding. Table (II.) shows the various causes of bleeding in the series analysed.

Table II. Causes of post-menopausal bleeding in 63 cases

Pathological lesion	Number of cases
Malignancy of vulva, cervix, uterus, tubes.	14
Innocent neoplasms of vulva, cervix, uterus, tubes.	13
Ovarian tumours.	1
Infections.	7
Dysfunctional uterine haemorrhage.	4

Trauma.	2
Haemorrhage from urethra, bladder, rectum.	3
Oestrogen therapy.	1
Unknown.	18

1. Malignant neoplasms of the vulva, cervix, uterus and tubes. There were 14 such cases, an incidence of 22.2%. By far the more common malignancies associated with uterine bleeding in this group are those occuring in the cervix or endometrium. Carcinoma of the cervix is in general the more common lesion amongst post-menopausal women. However, Norris (1935) observed that the relative incidence of fundal carcinoma after the menopause has been established, increases and practically parallels that of the cervix. In this series there were 9 cases of endometrial carcinoma, while only 5 were cervical. There was one other case in which the primary growth was situated in the bladder, but the bleeding was from the vaginal metastasis.

Carcinoma of the Fallopian tubes is a rare cause of post-menopausal bleeding. It has a very high mortality because it is a silent grower. Frequently the first and only symptom is a blood-stained discharge. When no uterine abnormality is found to account for the bleeding this condition must be kept in mind.

It is interesting to note that the longer the period of amenorrhoea the higher is the inicdence of malignancy. In this series 11 of the malignant cases had the bleeding after more than three years of amenorrhoea, giving an incidence of 73.3%. In 7 of these cases the bleeding occured after 10 to 18 years, while in 2 others the bleeding occured after 8 years.

2. Innocent neoplasms of the vulva, cervix, uterus and tubes. Endometrial and cervical polyps are the most common benign tumours responsible for post-menopausal bleeding. Though they are generally benign they should always be examined histologically for any malignant changes.

In this series there was one case in which a fibro-myoma was palpable, with no other cause for the bleeding being present. Uterine fibromyomata seldom cause post-menopausal bleeding. When they co-exist with such bleeding, the possibility of a sarcomataus change must be considered. Necrosis and ulceration in a submucous myoma may also cause bleeding.

3. Ovarian Tumours. Ovarian tumours, whether benign or malignant do not usually affect the menstrual function unless they happen to have a sex endocrine function. However, occasionally some cases of large tumours disturb the vascularity of the pelvic organs so much that abnormal uterine haemorrhage and even post-menopausal bleeding can occur. (Jeffcoate 1957). Bleeding associated with malignant ovarian tumours usually occurs when the neoplasm is advanced. This is probably due to bloody ascitic fluid discharging through the tubes and into the uterus or by an extension of the malignant growth into the uterine cavity.

There was only one ovarian cyst in this series, which was a benign serous cystadenoma.

In cases in which curettage reveals hyperplasia of the endometrium the presence of a small granulosa or theca cell tumour should be kept in mind. Any woman bleeding after a period of amenorrhoea of more than 3 years, in whom hyperplasia of the endometrium is found and provided she had received no oestrogens, should have an exploratory laparatomy, whether a palpable adnexal mass is present or not.

4. Infections. There were 4 cases of senile vaginitis and in 3 others the only pathological lesion was a cervical erosion. Cervicitis and cervical erosion rarely if ever cause post-menopausal

bleeding. Any bleeding lesion from the cervix must be considered malignant until proved otherwise.

Post-menopausal vaginitis is a common cause of bleeding in the elderly woman. The patient presents with a blood-stained discharge; sometimes there is bright, fairly profuse bleeding from vascularised adhesions in the senile vagina. The latter very often follows coitus. Speculum examination will usually disclose the bleeding spots in the vagina.

5. Hyperplasia of the endometrium. This may be another cause of bleeding in the post-menopausal woman. It is brought about either by a recrudescence of ovarian function or due to extra-ovarian oetrogens. The cause of hyperplasia of the endometrium is the absence of the influence excited by the corpus luteum and a persistence of the follicular influence. In metropathia haemorrhagica or retrogressive hyperplasia, of which there were 4 cases in this series (an incidence of 6.2%) the 'Swiss cheese' pattern persists, but the stroma is atrophic or even fibrotic. This is an inactive process and should be distinguished from active hyperplasia. The latter suggests that the stimulus producing hyperplasia is still operative. Novak (1956) is of the opinion that active post-menopausal hyperplasia may be looked upon as a pre-cancerous lesion because of the frequent co-existence of the two conditions. The gradations between very active hyperplasia of the endometrium and adenocarcinoma is not always histologically distinct. Although hyperplasia and adenocarcinoma may co-exist, the latter can certainly develop in an atrophic endometrium.

6. Injuries. Two cases in this series were found to be due to cervical and vaginal ulcerations caused by a neglected pessary. Other causes of bleeding due to trauma may be decubital ulceration or post-radiation ulceration.

7. Haemorrhage from urethra, bladder and rectum. These cases are usually mistaken for vaginal bleeding. There were three such cases, two of which bled from a urethral caruncle, and the third had carcinoma of the bladder with vaginal metastasis.

8. Oestrogen therapy. Most recent authors agree that the most frequent cause of post-menopausal bleeding is probably oestrogen therapy. This could not be shown in this series, since the information is hardly ever volunteered by the patient or general practioner and very rarely asked for during history-taking. In general, however, it must not be assumed that the bleeding is due to oestrogen therapy, even if the patient gives such a history. While oestrogen medication has never been proved to cause genital malignancy, it has never been considered to be a deterrent to its development. For this reason and because it merely drags out the menopause, the routine or prolonged administration of oestrogens in post-menopausal women is most undesirable.

9. Diseases of the blood with coagulation defects. Blood dyscrasias are uncommon causes of uterine bleeding. The use of anticoagulants for such conditions as coroanry disease or thrombophlebitis may occasionally be responsible for some bleeding.

10. Unknown cause. There were 18 cases (28.5%) in which no cause could be found.

Relation to systematic disease.

About two thirds of the cases were found to have some form of systemic disease, of which hypertensive cardiovascular disease was the most common, being in 42 of the cases. Diabetes was present in 3 cases, one of which proved to have carcinoma of the endometrium. The association of systemic disease

may have an effect on the management of these patients.

Management

Post-menopausal bleeding or discharge calls for immediate investigation, even if it is a single episode. A careful history is taken in the clinic. It is important to enquire whether the patient was having any oestrogen medication beforehand. Even if this was being given, it must not be assumed that it is the cause of the bleeding.

Diagnostic curettage. Examination under anaesthesia, diagnostic curettage and possibly cervical biopsy are necessary in every case. This should be done even if the vaginal and cervical smears are negative for cancer cells. Curettage is not infallible since it has been shown that 5-10% of endometrial carcinoma can and are missed by the curette. However, a thorough curettage under general anaesthesia remains the more desirable and more direct approach in the investigation of these cases.

The presence of a cervical polyp or senile vaginitis does not exclude the presence of carcinoma of the uterus. When a cause is found treatment is directed to it.

When no cause for the bleeding is found, usually 20-50% of cases, it is reasonable to wait events. These cases should be followed up for at least six months to see whether the bleeding recurs. At each visit the history is reviewed, the patient is re-examined, and smears for cytology taken if necessary. Even if curettage gives negative results, the recurrence or persistence of bleeding or discharge always calls for a laparotomy. This may be the only way of detecting an early carcinoma of the uterus, tube or ovary.

Exfoliative cytopathology. The Papanicolaou smear is nowadays being performed as a routine investigation in several units. Exfoliative cytopathology is still in its infancy and so not without imperfections. A negative smear should not give one a sense of security, especially when considering endometrial carcinoma. False negative smears are much more common in the presence of endometrial carcinoma than they are in carcinoma of the cervix. The reason for this is two-fold. Firstly the individual cells in endometrial cancer are often much less malignant looking than the cells in epidermoid carminoma. Secondly, cervical stenosis of various degrees occurs in post-menopausal women and so few or even none of the malignant cells find their way into the vagina. The cytosmear is definitely more reliable and useful in cervical carcinoma.

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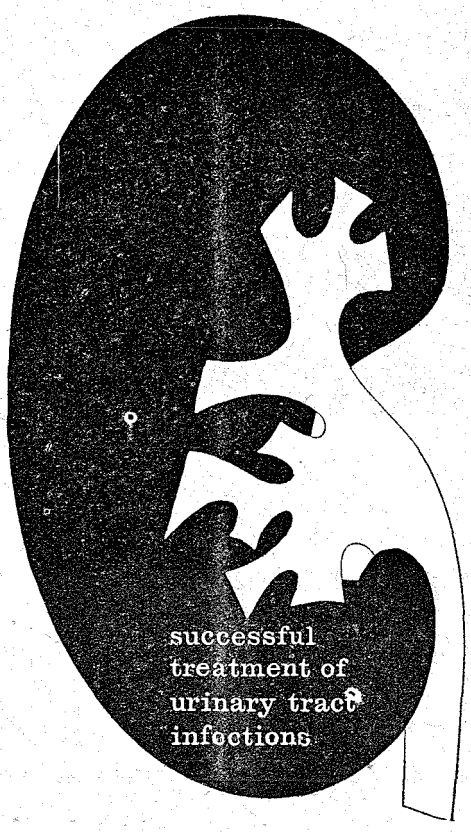

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Some Consideration On 100 Fatal Traffic Accidents

by Dr. V.T. Camilleri M.D.

The object of holding an autopsy after each fatal traffic accident is primarily to establish a direct relationship of cause and effect between the accident and the fatal result. Incidentally, however, it achieves another object as well which may be regarded as being equally important because each autopsy will, as part of a pattern, yeild information which may lead to the devising of ways and means of lessening the number of accidents, or at least of preventing their fatal termination.

1 The relationship between the accidents and death

In a traffic accidentit is fair to conclude that the death of a person involved in such an accident is due to it. This, however, is not always so, and occasionally the reverse may actually be the case. A post-mortem examination then becomes imperative to arrive at a correct conclusion. In most cases the interpretation of the findings is easy; inothers it may be less so; in a small number it may even be difficult.

I shall cite a few cases to illustrate this.

Case 1. P.N., aged 47, a chauffeur, was driving his bus through Rabat when, for no apparent reason, he crashed into a wall. He died six hours later without regaining consciousness. At the autopsy diffuse arteriosclerotic changes were found together with scarring of the kidneys due to pyelonephritis. No traumatic lesions were found, but there was a large pontine haemorrhage.

This case presented no difficulties: the man was a known hypertensive who had just returned to work after a period of rest, and an ante-mortem diagnosis of apoplexy had already been made. In the next case, however, such a possibility was not even suspected, and it was only at the autopsy that matters were cleared up.

Case 2. G.P., 57 years old, of Gozo, was returning home in an open truck after a day's work. He fell out of the truck and was picked up unconscious, and died after three days. Here again there was diffuse arteriosclerosis together with a typical cerebral haemorrhage. The only traumatic lesions were two small bruises, one on the right arm and one on the right side of the chest.

There is no doubt that, without a post-mortem examination, this man's death, which was due to apoplexy, would have been attributed to bad driving; and again it was the autopsy that, in the next case, established without any doubt that death was due to the injuries sustained, and was independent of the associated arteriosclerosis.

Case 3. G.G., 57 years old, of Rabat, was on his way to work when the truck he was in hit against a wall, and he was thrown out of the truck with several others. He was picked up in a state of shock and died on his way to hospital. Arteriosclerotic changes were present; there were no cra-

nial or cerebral lesions; his left humerus and several ribs on the left side were broken, and his abdomen was flooded with blood from a torn spleen.

Actually none of these cases presented any difficulty as the sequence of events could be followed with certainty, but an occasional case does crop up where the interpretation of the findings is far from easy. Case 4 is a good example of such an occurrence, because of the rarity of the lesion found and the combination of circumstances.

Case 4. R.F., 18 years old, was going on his bicycle through one of the streets of his village, when a truck appeared at the other end. As the street was none too wide, the truck slowed down, but the lad went on. When near the truck he was seen to wobble and then hit against the side of the truck. He was picked up unconscious and taken to hospital where he died three days later. At the autopsy the only traumatic lesion found was a small graze at the back of his right hand, but there was a large subarachnoid haemorrhage around the pons and the medulla, due to the spontaneous ruptures of a vessel and quite independent of the accident.

I admit that it seems to be asking too much to postulate the spontaneous rupture of a blood vesel at such a critical moment, but this does not mean that it cannot happen, and I contend that it did happen in this case. That I am correct in my interpretation of the findings becomes evident when they are confronted with the findings in the next two cases, both of which occurred under comparable circumstances, and in one of which the cerebral damage was accompanied by cranial lesions as well.

Case 5. J.F., a young lad of 15, was going down to Marsaxlokk from Zejtun on his bicycle when he collided with an oncoming car. Death supervened after 11 hrs. of coma. At the post-mortem examination numerous cuts and bruises were found on his face arms and legs; there was a large bruise which extended from his left ear to the lower end of the sternum across his neck and chest; neither the thoracic nor the abdominal organs were injured. The skull was not fractured, but there was diffuse subdural and subarachniod bleeding and numerous punctate haemorrhages in the brain substance itself, together with severe bruising of both frontal lobes.

Case 6. V.C., aged 18, of Sliema, was taking part in a cycle rally when, during a spurt of speed, he ran into a stationary truck. He was picked up unconscious and died within an hour. He had cuts and bruises of the face, arms and legs, and a fracture of the left femur. A fracture of the left temporal bone spread into the base of the skull; the brain showed diffuse subdural and subarachnoid bleeding, punctate intracerebral haemorrhages and severe contusion of the left temporal and controlateral frontal lobes.

It will be seen that the lesion in Case 4, consisting of a gross and local-

ized cerebral haemorrhages, is similar to the lesions found in Cases 1 and 2, which are due to vascular disease, but in marked contrast to the finer and more generalized cerebral damage found in Cases 5 and 6 and which are the result of a traumatic cerebral lesion.

But, apart from such cases of reversal of the ordinary accident death relationship, we also come across across cases where the autopsy shows that other intervening factors have contributed to bring about a fatal result, and in these cases we may find it difficult to asses to what extent the injuries have contributed towards the causation of death. Thus, death may occur in cases of relatively minor injuries because of old age or previous ill health, or because of the insurgance of complications, and in a few cases we feel bound to admit that, but for an element of human error, the case should have endeddifferently.

Case 7. F.C., aged 25, of Gozo, was going in his motorcycle when he collided with a car and was thrown into an adjoining field. He was picked up dead. Except for bruises and scratches no traumatic lesions were found. The heart was, however, enormously enlarged because of an adhesive pericarditis and a vegetative endocarditis.

There can be no doubt that, but for his heart condition, this man should not have succumbed to his trival injuries. This case is, however, both dramatic and exceptional, but the next is quite typical and is met with with relative frequency.

Case 8. S.A., 78 years old, was knocked down in Birkirkara and sustained a fracture of both legs. He died a fortnight later. The autopsy showed a small fibrotic prostate with retention of a foul purulent urine; small, pale shrunk kidneys; a hypertrophic heart with advanced sclerosis of both Aorta and Coronaries. Death was due to a terminal pneumonia. No other traumatic lesions except the fractures of the legs were found.

Complications accounted for three deaths: they were gas gangrene (compound fracture of femur), pulmonary embolism (fracture of femur) and fat embolism (fracture of tibia). In eight cases the 'element of human error' appears to have contributed towards such an ending: in three of these the injury had not been diagnosed, in the other five either too much was done, or what was done, was done too soon.

Case 9. S.F., aged 7, was knocked down by a car. He was taken to Hospital deeply unconscious and with stertorous breathing. The left humerus had been fractured. He died after twelve hours without having regained consciousness. At the autopsy there was the diffuse subdural and subarachnoid bleeding common in severe contusions of the brain, but there was also a torn spleen with consequent intra-abdominal haemorrhage.

Even admitting that the progmosis in this case was unfavourable because of the brain lesion, I feel that death should be attributed to the rupture of the spleen which had not been diagnosed.

Caes 10. G.B., 11 years old, was knocked down by a car at about 4p.m. He got up immediately and ran away, but two hours later he became unconscious

and died at 8 p.m. Death was found to be due to an extra-dural haematoma from a torn Middle Meningeal Artery.

Case 11. A.S., aged 12, was pillion riding on the carrier of a pushbike when he fell off it and knocked his head against the ground. He was momentarily stunned, but then got up and went home, where he had his usual lunch. Two hours later he started complaining of a headache and soon became unconscious. He died at 8 p.m. A fissured fracture of the parietal bone had torn his Middle Meningeal Artery, producing an extra-dural haematoma.

In both these cases an early diagnosis would have rendered possible a life saving operation.

Case 12 D.N., aged 12, was admitted to hospital suffering from a fractured pelvis after having been hit by a car. She died after three days. At the autopsy the ramus of the os pubis was found fractured, but there was no displacement, and the extravasation of blood in the pelvic floor was minimal and limited to the immediate neighbourhood of the fracture. The pleural and the peritoneal cavities were filled with a clear transparent liquid. Death was due to a terminal pneumonia in a waterlogged lung.

I attribute this death to an electrolyte imbalance brought about by the child having had too much 'drip'. I admit that my contention is debateable, but I still cannot help thinking that a little less drip would have materially altered the course of events.

Case 13. J.T., aged 18, was involved in a head on collision with another car. Besides the usual cuts and bruises on the face and hands, the main lesion was a fracture of the right femur and of the pelvis with extensive extravasation of blood in the pelvic floor and in the retroperitoneal tissues.

Case 14. J.P., aged 18, was the driver of the other car in the above collision. The lesions found in the previous case except that they were on the left.

Both had been rushed immediately to hospital in a light car, and both died within a very short time after their admission. Naturally, I am not prepared to say that these two lads could have survived their undoubtedly severe lesions, but I feel that, had they had restorative measures before being transported in their shocked condition, they would have stood a better chance of recovery; so much so that a third companion, a passenger in one of the cars, did recover, in spite of severere injuries, simply because it took some time to extricate him from the debris of his car.

I have so far described some illustrative cases to show the necessity of holding a post-mortem examination in such cases in order to be able to establish a direct relationship between the accident and death. I now propose to consider the accident in relation to its three possible victims: the pedestrian, the driver of the vehicle and its passengers, and proceed to draw some conclusion which may point to how to prevent these accidents.

I may add that I am using the word 'vehicle' intentionally, so as to include not only all types of motor-driven vehi-

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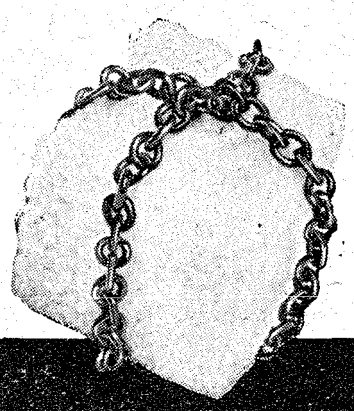

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cles, but also pushbikes, and that rarity of modern times, the carrozzin as well.

I shall start with the pedestrian.

2. The role of the pedestrian

Table I shows the distribution of accidents among the various age groups. It will be seen that in the pedestrian the accident rate is greater at the two ends of the scale, whilst the occupants of the vehicle, whether driver or passenger, are more often affected in the middle groups.

TABLE I

	- 10	11 — 20	21 — 30	31 — 40	41 — 50	51 — 60	61 — 70	71 — 80
Pedestrian	22	6	3	3	2	3	5	5
Drivers	—	10	12	7	3	—	—	—
Passengers	1	6	7	1	1	1	1	1
	23	22	22	11	6	4	6	6

This, I think, would suggest that there is a definite correlation between age and the accident rate, and that the irresponsibility of children and the foolhardiness of old people concur as much as the imprudence of drivers in the causation of an accident. A more detailed examination bears this out.

Out of 49 pedesrtians killed no less than 28 were under twenty years of age, and of these 22 were less than ten years old, 4 were less than twelve years, and the other two only fifteen years old. Undoubtedly, in many cases, with greater prudence, the driver might have avoided the accident, but on the other hand the child quite as often seems to have done its best to get run over. If we exclude those cases where it is obviously the driver's fault, such as that of a baby of ten months crushed against the wall in his pram by a car out of control; and that of a girl squeezed against the wall by a runaway truck which had been left untended, there remains many an instance where the driver does not appear to be as blameworthy as first impression would suggest, My notes, in fact, show that in six cases the child had come running out of the house, or from behind a stationary object, right into the path of the car. And five other children, whose ages ranged from eighteen months to ten years, had run behind the bus or truck after it had started backing. One cannot help thinking that some of these tragedies could have been avoided by a greater degree of vigilance on the part of the guardians of the children, or if there were fewer children running about in the streets playing.

In the last two decades 10 pedestrians lost their life; in six the extent of the injuries was sufficient evidence of the severity of the impact, and therefore presumably, also of the speed of the vehicle, but in four the injuries were minimal. This would tend to show that we are apt to take too simplicistic a view of these accidents in attributing them all to negligence or overspeeding on the part of the driver, and that we should look for other factors as well to account for some of them. That this is so is borne out by some of the cases occuring in the middle age-groups, where the negligence appears to be on the part of the pedestrian rather than on the part of the driver. I shall mention only one instance, that of a man of twenty-six, who, in one of the busiest cross-roads of Qormi, got out of his car and crossed the street without even bothering to look about him, only to be knocked down by an oncoming car. We all know — and some of us from personal experience, as we have been guilty of such an imprudence ourselves — that this is a very common occurrence indeed.

Putting all the onus of these accidents on the driver will not help to solve the problem of the increasing accident rate simply because it will not take into account the fact that the pedestrian may be at fault as well. Greater vigilance of

the children is indicated and they should not be allowed to play in the streets; in this respect the provision of playing grounds for the children is a move in the right direction. The man in the street, especially the older one, should think of traffic as it now is, and not as it was once both more leisurely and less congested. More authorized crossings should be provided, especially in areas of heavy traffic; pedestrians should be taught to use them, and drivers to respect them and both penalized for breaking this rule. An Italian gentleman's comment is going down Kingsway some time ago comes to my mind: he said that cars can use Kingsway only through the goodwill of the pedestrians.

Need one say more?

3. The vehicle and its users

Fiftyone cases will be reviewed under this heading, and they can be split into two categories: 36 cases in which speed appears to be the dominant factor in the causation of the accident, and 15 in which it may either be excluded, or at most assigned a secondary role.

These last 15 cases are made up as follows:—

3 cases in which the victim was thrown was the cause of death (Case 2), or of the accident (Case 1and a probable case of petit mal);

3 cases in which the victim was thrown out of the vehicle; a boy of six and a man of fifty-seven fell out of the car through the accidental opening of the door of the car, and a man of twenty-six, a sailor, through the overturning of the carrozzin he was riding in;

2 (a boy of twelve and a man of twenty-four) were run over when they got off the bus they were in before it had come to a stop;

1 labourer was run over by a bulldozer;

1 another labourer, was crushed against the wall by a tractor;

1 a boy of twelve, fell off the carrier of a pushbike (Case 11);

The remaining fourteen were unusual enough to deserve a more detailed description.

Case 15. G.C., aged 50, was on his motorcycle behind a truck in a narrow lane off Zurrieq. The truck slowed down to enter a side alley. For some unknown reason the man, who had just taken his driving licence, appears to have accelerated instead of slowing down, and collided with the truck, hitting his chest against a projecting rod, which pierced him through the heart.

Case 16. G.G., aged 40, was riding his motorcycle in Tarxien when he hit the handlebar of his cycle against the side of an oncoming truck. He fell down and died within a few minutes. At the autopsy there was a large bruise of the right side of the abdomen; underneath the Rectus Abdominis was split, and, though neither the peritoneum not the bowels were found injured, the the abdominal cavity was found flooded with blood from a large tear of the Common Iliac Artery. The man had evidently been thrown against the handlebar by the impact, even t h o u g h it was ascertained that neither vehicle had been going at anything beyond ordinary speed.

Case 17. F.V., aged 24, was going down Duke of York Avenue on a rainy day. He skidded, fell off his Lambretta, and hit his head aginst the corner of the Nato building. He died practically on the spot. Complete disruption of the base of the skull, starting from a fissure in the frontal bone, was found

at the post-mortem examination. And yet, the man had been going at a snail's pace.

Case 18. A.B., aged 37, died under very similar circumstances. He was going along a narrow lane on his Lambretta when the tip of his handlebar hit against the tip of the handlebar of a motorcycle coming from the opposite direction. Both drivers fell; the cyclist got up unhurt, but A.B. was picked up unconscious and died within a few minutes. A small circular bruise right in the middle of his forehead was the starting point of a fracture in the frontal bone which spread into the base of the skull, disrupting it. In falling, he had hit his forehead against the knob of his headlamp.

The other thirtysix cases were clear cut cases of overspeeding. Of these, twentyseven were what may be described as 'ordinary' overspeeding, but the other nine cases were instances of people returning from a party, or at least enjoying a joy ride, and therefore, presumably under the influence of alcohol.

Going at speed is an exhilirating sensation which is an end in itself. It makes us forget the risks we are running. An open stretch of the road is an incitement to which many a middle-aged man succumbs, and which a young man will not even attempt to resist. It is dangerous always and everywhere, even on the best of roads . . . . imagine how much more dangerous it can be on our roads where every few hundred feet one comes to a bend or a crossroad! If we spy another car ahead of us, we feel the urge to overtake it; if we are overtaken by one we consider it a challenge to our mettle, and we press on the gas, disregarding the rising speedometer, and end in disaster.

This, I think, is one of the major reasons why so many accidents happen today. Whose fault it is? Partly the fault of our times. There have always been traffic accidents, and man has always enjoyed speed, but it is only today that he has been provided so copiously with such admirable means to enjoy. We can understand why a driver should want to press on his throttle with more enthusiasm than sense, we can even sympathize with him, but we cannot condone the practice. In the interest of Society we have to repress it, harshly if need be. But to do so effectively, I think that greater stress should be laid on the dangerous quality of the driving, and less on the mere fact that the speed limit has been exceeded. Undoubtedly, beyond a certain limit, excessive speed and dangerous driving become synonymous, but technically excessive speed need not always be dangerous, whilst, under unfavourable circumstances, even technically not excessive speed may become so.

No such extenuating considerations can, however, be made in favour of the man who drives whilst he is under the influence of drink. Alcohol affects both our prudence and our capacity to react properly in an emergency. In such cases I consider that the imposition of fines to be totally inadequate as a deterrent, whilst a short period of rest and meditation as one of Her Majesty's guests, together with the withdrawal of the driving licence, temporarily or permanently as the case may require, would be both corrective and preventative, and a just reward for what morally amounts to murder. But, in order to be able to apply such sanctions, there must be absolute, irrefutable proof of such a condition: not the mere opinion of an individual, however eminent he may be, but incontrovertible evidence of an im-

personal laboratory result. This is the more important because it is not the man who is obviously "under the influence" that is the more dangerous, but he who, after taking a drink or two, feels and appears to be quite steady, but at the same time thinks that all he needs to be transformed into an imitation Stirling Moss is just that extra drink he took. And this type cannot be brought to book unless all drivers involved in an accident, fatal or otherwise, have their blood alcohol estimated if even the slightest suspicion of such a possibility exists.

4. Injuries

Whilst a detailed description of the injuries sustained in these accidents is beyond the scope of this article, a few general remarks about their distribution in the body may be of interest because of the conclusions that may be drawn from them.

Reference to Table II showing the distribution of the injuries in the body will show that head injuries are by far the most common lesion, car users and pedestrians sharing them with equal frequency, with this difference however, that whilst in the pedestrian these lesions are to be found mostly on the side of the head or in the occipital region, whence they spread into the base of the skull, in the vehicle users they are most commonly met with in the vault or in the frontal region. This is due to the different mechanism producing these fractures, for, whilst the pedestrian, before being thrown to the ground by the impact, is generally bent backwards or sideways immediately he is hit, thus knocking his head against the superstructure of the colliding vehicle, the users are more often catapulted forward against the ceiling in the case of a closed vehicle, or against any other object in the case of cyclists or motorcyclists.

TABLE II

	Cranio-cerebral	Thoracic	Abdominal	Skeletal
Pedestrians	32	12	6	11
Drivers	22	10	4	4
Passengers	12	4	4	—
	66	26	14	15

In fortyone cases the head injury was not associated with other lesions, except the usual cuts and bruises to be expected in such accidents, but in twentyseven they were accompanied by serious lesions elsewhere (15 pedestrians and 12 'users'). In only two cases (Case 10 and 11) was the head injury amenable to treatment; all the others were of such severity that they were beyond all help.

Thoracic injuries were mainly of the stove-in variety, with multiple fractures of the ribs. In practically all cases the lung was either torn or at least very badly bruised; in four cases the heart had been pierced by spicules of bone from the broken ribs; in three cases there was also a fracture of the dorsal spine; in one case the Inferior Vena Cava was torn, and in another the Pulmonary Artery; in thirteen there was an associated rupture of the liver or of the spleen.

Only two cases of purely abdominal lesion appear in this series: the man died of a torn Iliac Artery (Case 16) and a young sailor of twentytwo whose abdomen was crushed against the driving wheel of his car, and who died of mesenteric thombosis seventeen days after the accident. The other cases listed as abdominal are really thoraco-abdominal injuries with rupture of the liver or of the spleen with no fracture of the ribs.

Fractures not associatd with visceral lesions occurred 15 times, and, as is to be expected, they predominate amongst the pedestrians (11 cases). The pelvis was injured six times, the femur eight times, and the tibia twice; there was

also a fracture dislocation of the cervical spine which occurred in a driver whose car crashed into a wall. In five cases death was due to the severe shock resulting from the injuries sustained whilst in the remaining ten it is to be attributed to complications setting in.

By and large, therefore, one may say that most of the injuries were of such a severity that death was unavoidable. This means that the prevention of these fatalities lies mainly in the prevention of the accident itself. Our primary aim should therefore be the reduction of the accident rate; but, as it is not likely that the present day congestion, with its greater attendant risks, will get any easier, such a reduction cannot be attained by purely repressive measures, whilst an educational campaign to make the public realize that its cooperation is indispensable — the drivers by becoming more conscious of their responsibilities, the pedestrians by taking greater care of themselves — will give better and more lasting results. And, if at the same time the conditions under which traffic flows be improved, so as to eliminate as many possible sources of danger as is practicable, the result will be more evident still.

This, however, should not make us loose sight of the fact that, whatever we may do, accidents will happen, some of which are bound to be serious. The prevention of a fatal result in such cases then becomes our main object, and we can achieve this in one of two ways, either by devizing some sort of protection against such injuries, or by counteracting their ill effects once they have been inflicted. To attain the first, protective head-gear for motorcyclists, and strapping for cars users have been in use for some time, and their use should be encouraged as they will often afford reasonable protection against possibly fatal injuries; but as no such protection can be given to pedestrians, nor can these appliances guarantee full protection, it is often on the second alternative that we have to rely to save life. A trained first-aid team, fully equipped with all the necessary means of resusciation is a prime necessity in this respect, and it should always be on call to attend to all serious accidents on the spot. That such cases are few and far between is no reason why such a measure should be considered superfluous, as even only one life saved more than justifies its institution.

CONCLUSION

In this survey of 100 fatal traffic accidents I have tried to show that, because many factors contribute towards the occurrence of these tragedies, the problem of their prevention must be tackled from various angles. The control of traffic, both pedestrian and wheeled, and more stringent judicial sanctions may lessen the number of accidents; the use of mechanical protective devices, together with prompt and adequate first-aid measures may diminish the number of fatalities; but it is only by educating the public to respect the code of the road than one can hope to bring down the number of accidents to that irreducible minimum which, I am afraid, no amount of human care and skill will ever be able to avoid.

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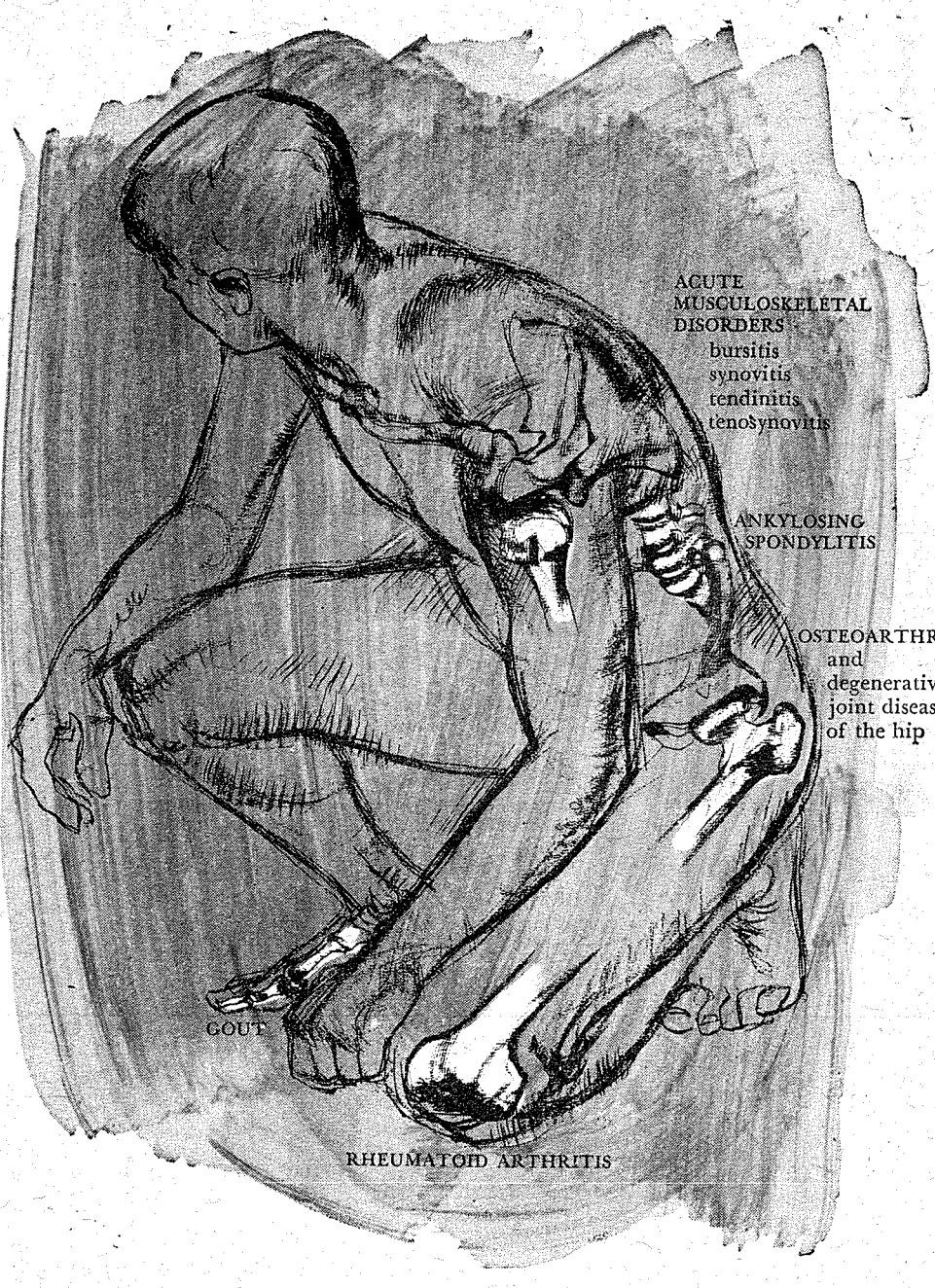
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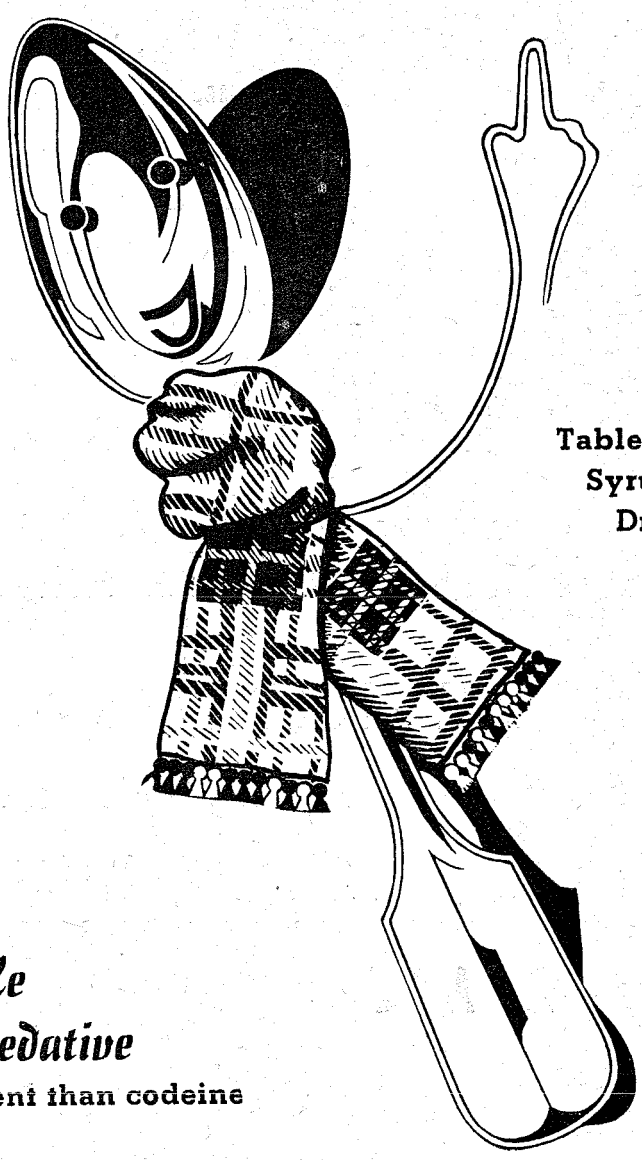

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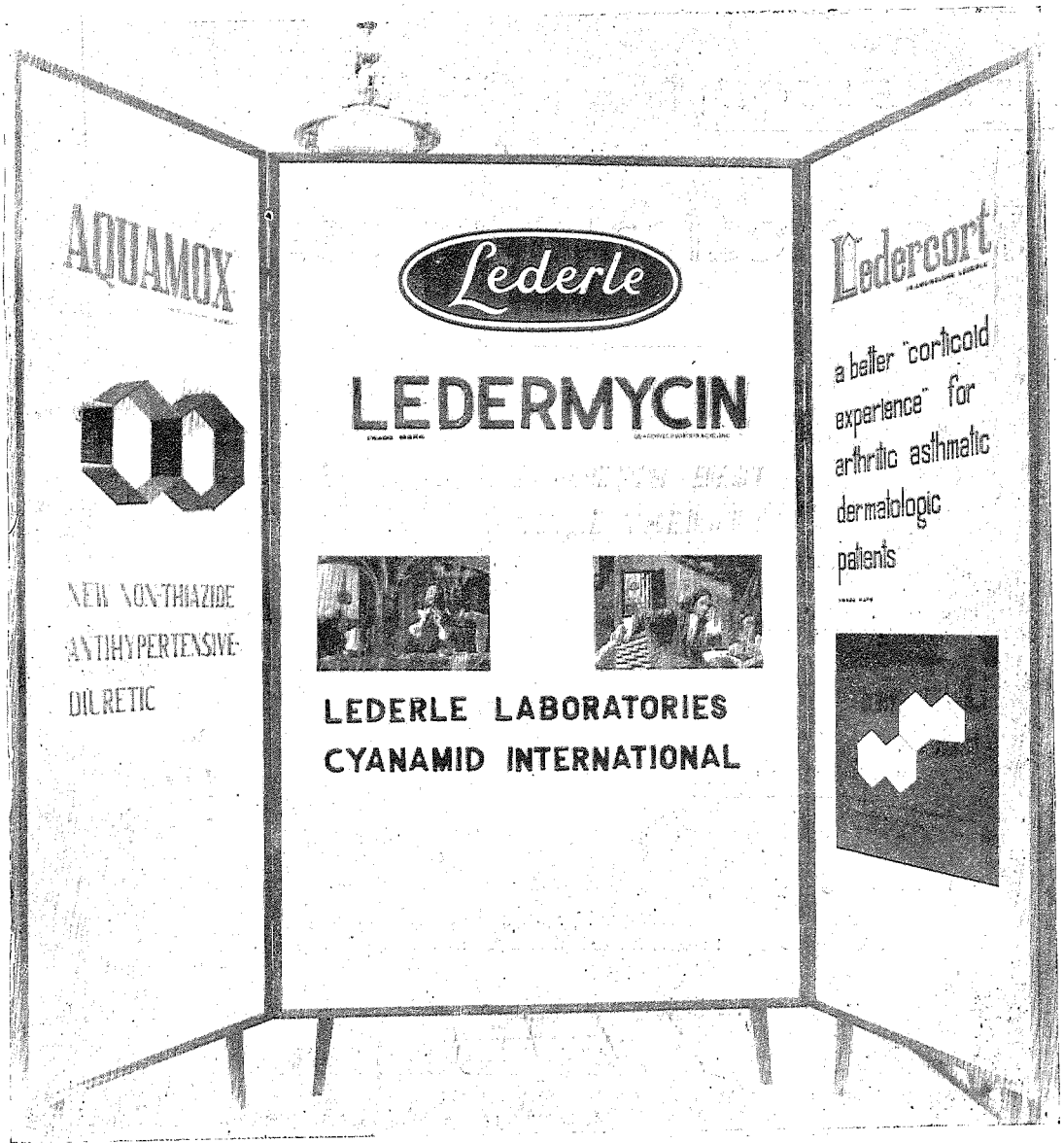

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