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AFTER THE MEETING

The 12th Annual Clinical Meeting of the British Medical Association, held in Malta between the 9th and the 12th April, is now a thing of the past but we feel we must note the event in this gazette both for the information of our readers overseas and to enshrine in a durable form the record of an event which has been successful even beyond the highest expectations. It has been a long stretch from the time, about 2 years ago, when the local Branch put forward the invitation to the parent body to the night when over 500 members and guests assembled at the banquet which marked the official conclusion of the meeting. The meeting, whose organisation was necessarily very complex, was repeatedly said by our guests, not only in formal pronouncements but in unofficial comment, to have been almost faultlessly run and that Malta had set a standard which other host towns would find it very difficult to equal, let alone surpass. With regard to the many tasks involved, we must regretfully avoid mentioning individuals, for this was a case of amicable teamwork, always the best means of producing good results.

The scientific sessions constituted, of

course, the most important part of the meeting and here again we find the choice of subjects was such that it brought out valuable contributions, providing authoritative speakers with occasions, which were used to the full, to put forward their views. Once again it is difficult to state which were the most interesting sessions but it may be fair to state that those on traffic injuries, on iatrogenic diseases and on the medical aspects of tourism in the Mediterranean appeared to have appealed most to the imagination of medical and lay members of the audience. In holding a session on iatrogenic diseases the association was certainly taking a risk ("sticking its neck out" would be the expressive popular phrase) but it was one which was justifiable and indeed necessary. As was said, if one cannot grant the profession the merit of infallibility, one has to concede to it the great virtue of honesty. Some, at least, of the speakers realised the importance of putting things pungently (what would not do in a textbook is permissible in a paper) and it amused us to see how widely professor Ganado's quip that one should only go barefoot, like Miss Sandie Shaw, only on a sandy shore, was reported in the British press, causing presumably many a chuckle at thousands of breakfast tables. This also showed how a mere pleasantry is apt to get great attention while some far weightier and more valuable observation may pass unnoticed. Through his comments on possible health dangers in Tunisia, the editor of this periodical brought on his head the wrath of the Tunis Tourist Board. This is what often happens when instead of talking one actually says something, but it was particularly galling because he had only quoted what Tunisian scientists had, in all honesty, reported; in fact it was not these scientists but the Tourist Board which objected. It remains ever surprising and annoying what misquotation and misreporting can do. Medical men are trained in a habit of precision and will say what they mean and no more. What the present writer said about Tunis was even construed as casting a slur on Morocco, which was strange seeing that hundreds

of miles separate the two countries. He had nothing to change and nothing to withdraw in this context and indeed does not feel that his careful statements need even endanger his personal valued friendship with the Tunisian scientists who, like him, cherish truth above everything else. Incidentally we repeat that Tunisia is a most interesting country to visit and we wish its expanding tourist industry the best of luck.

The social events went with a swing. One wondered how ladies from Great Britain with its excellent shops and abundance of fashion exhibitions could be interested in a local dress show but in this, it seems, we, like so many other males before us, had failed to plumb the depths of the feminine mind, for in fact they enjoyed the fashion show. The local inhabitant is also a trifle mystified by the magnetic pull which Gozo seems to exercise, but here again we underestimated Calypso's charms, for the Gozo excursions were amongst the most successful of the events. The inaugural meeting and the banquet were honoured by the presence of the highest authorities. At the banquet it was a heartening omen to hear the Prime Minister quote Kipling and not only insist that the Imperial poet was right but that he was right "as usual". It was also proper that on such an occasion the audience was told that it was Britain which has built our present medical school and our university. The Honourable Dr. George Borg Olivier felt it would be superfluous to speak in praise of British medicine; "one might as well", he said, "spend his energy in praising the sun for shining".

We are in the happy position of being able not only to express the hope that similar events will recur but to say that they have in fact done so already, for, between the 7th and the 9th May, the Medical Faculty had the pleasure of welcoming the Moynihan Chirurgical Club, a smaller body than the B.M.A. but an important one none the less, and of reading papers at two scientific sessions. The Società Italiana di Gastroenterologia also met here at the end of May. All these are excellent auguries for the future.

A STUDY OF BRONCHIAL ASTHMA IN MALTA

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This paper was read at the 12th Annual Clinical Meeting of the British Medical Association in Malta.

Information on the incidence of bronchial asthma in different parts of the world is scanty, but available data suggest that incidence of this condition throughout the world is fairly comparable. In a survey of childhood asthma carried out in Aberdeen in 1962 and reported this year, an incidence of 4.8% was found (Dawson *et al.*, 1969); whilst Fry (1965) reported an incidence of 2.5% in his practice in the South of England. Grant (1959) claims that asthma probably affects at least 1% of the population of Great Britain. Studies in the United States of America and other countries all give an incidence close to 1%.

The incidence of bronchial asthma in Malta is not well documented. Nevertheless, the general impression among practising physicians in Malta is that the incidence of asthma in these Islands is high. During the year 1834, when the population of Malta was just over 100,000, 42 patients were reported to have received treatment for asthma at the Dispensary in Valletta (Davy, 1842). Assuming an incidence of 1% comparable with that in other countries, it is estimated that there are about 3,000 asthmatics in Malta today. The figure is bound to be much higher if other types of respiratory allergy, such as allergic rhinitis were to be included. Vaughan and Black (1954) reported an inci-

dence of 10% for all forms of respiratory allergy in the United States of America.

This paper is based on a study of a personal series of 419 patients treated for bronchial asthma between 1964 and 1968. There were 217 males and 202 females. The age of onset was worked out for all the cases and this is illustrated in *Table I*. One hundred and fifty cases (36%) had their onset in the first decade of life as compared with 39.7% of cases in Unger and Wolf's (1943) series. In Ogilvie's series of 1,000 patients, 62% had their onset below the age of 16 years as compared with 51% of the Maltese patients. It is interesting to note that in females, the age of onset extended over a longer period of time. Nonetheless the age of onset of asthma in the Maltese patients studied follows more or less the same pattern as that reported by other workers.

Thirtynine per cent of the patients were under 20 years of age when first seen compared to 31% in the age group 20 to 39, 24% in the 40 to 59 age group, and 6% in the age group 60 and over. The oldest patients seen was 71 years old and he had been suffering from asthma for 8 years. At the time when the patients were first seen, 44% had the disease for more than 5 years and 14% for over 15 years. It was also noted that many patients, who had asthma in childhood outgrew their asthmatic tendency at the time of puberty and started to have asthmatic attacks again in adult life. This state of affairs occurred in 37 of the cases and the asthma

TABLE 1

Distribution by age of Bronchial Asthma
in 419 cases (1964-1968)

Age	0 —	10 —	20 —	30 —	40 —	50 —	60 +	Total
Male	89	37	24	23	18	16	10	217
Female	61	41	33	30	26	8	3	202

free period in this group varied from 4 years to 30 years.

A family history of asthma was obtained in 129 cases (31%); one or other parent had asthma in 37 instances. More than one case of asthma was frequently recorded among relatives of individual patients. If other atopic conditions, such as hay fever, eczema, and allergic rhinitis are included, one can obtain a hereditary history in 45% of the cases. These figures again substantially agree with most published series. The existence of a genetic factor in asthma seems very likely; however though Viswanathan (1965) has suggested that the mode of inheritance of asthma is probably through an autosomal recessive gene, the results of extensive studies to define the mode of inheritance of asthma have been contradictory (Schwartz, 1952). It is most likely that environmental factors as well as genetic factors are necessary for the development of the overt manifestations of bronchial asthma.

All the patients were questioned about a history of allergy. Sensitivity to house dust, feathers, pollens and animal hairs was present in 40% of the cases, and multiple sensitivities were common. There was one case of asthma caused by hypersensitivity to aspirin. There were no patients with a history of food sensitivity. Though bronchial inhalation tests are considered to provide a more precise aetiological diagnosis than skin tests, (Aas, 1969), there is no doubt that when correlated with the clinical history, skin tests are frequently informative. Skin testing was carried out on 98 patients, all of whom gave a definite history of allergy and exhibited eosinophilia in the blood and/or sputum. No skin tests were carried out on any asthmatic presenting after the age of 35. Skin tests for food allergy were not carried out as these have been found to be of limited value (Chobot and Hurwitz, 1937), moreover the importance of food allergy in asthma is still very controversial (Aas, 1967). Results of skin tests showed that house dust and pollens were by far the most important allergens. One patient developed an attack of asthma

within half an hour of skin testing; she was found to be sensitive to pollen and did very well following desensitisation. Desensitisation was carried out in 54 patients and *Table II* shows the results of desensitisation treatment. Twelve patients

TABLE 2

Desensitisation in Bronchial Asthma
No. of asthmatic patients desensitised=54

<i>Results</i>	<i>No. of patients</i>
Marked improvement	12
Better	17
No improvement	25

showed marked improvement with no attacks or an occasional attack over a follow-up period of 1 to 3 years. There was a reduction in the rate and severity of the attacks in 17 patients whereas 25 showed no improvement at all. It is relevant that desensitisation treatment is only successful in a small percentage of cases; however desensitisation, especially in children, for unavoidable inhalants must always be considered, for, as Mansmann (1968) rightly points out, it is currently the only method that offers the patient any hope of basically modifying his state of hypersensitivity.

The relationship between bronchial asthma and respiratory tract infection is a close one. Ninetyfour patients claimed that the first attack of asthma followed a respiratory infection, mostly bronchitis. Moreover about 54% of the cases gave a history of recurrent chest infections. There is no doubt that an increased frequency of infections, viral and bacterial, is encountered in both childhood and adult asthmatics, who are proficient producers of mucus. The role of viral and bacterial respiratory infections in inducing a state of hyperactivity of the bronchial mucosa and muscle has been investigated (Ouellette and Reed, 1965) and experiments suggest that previous immunisation or natural exposure to infection in addition to allergens, predisposes some patients to heightened and earlier symptomatic response when exposure to the live virus or bacterial products occurs.

In asthma, it is often difficult to assess

the importance of emotional factors as in a number of cases the emotional stress is just a reaction to the asthmatic attack itself. Emotional disorders were considered to be important precipitating factors in 23% of the cases; the emotional trigger being however more prominent in females, 60 cases as compared to 36 cases in males.

Thirty eight per cent of the cases were seasonal, whilst the remaining 62 per cent were perennial. Of the seasonal cases, 60% occurred in winter, 23% with the change of season and the rest in summer. Patients often complained that the asthmatic attacks were precipitated by sudden changes of weather or sudden exposure to cold; the *scirocco* or south-east wind, which is usually very damp, was deleterious to the asthmatic. Excitement, physical exertion, inhalation of tobacco smoke, and fumes from chemicals such as kerosene were commonly mentioned as precipitating factors.

Thirtynine patients (9.3%) out of the present series were admitted in status asthmaticus. *Table III* shows the number of patients admitted to St. Luke's Hospital in status asthmaticus between the years 1964 and 1968, as well as the mortality from status asthmaticus in the same period. It shows that 56% of the cases were

over the age of 50. There were 9 deaths, giving a yearly date rate of 0.7 per 100,000 of living population; this figure does not include deaths from asthma occurring outside hospital. It is pertinent to remark here that St. Luke's Hospital is the only general hospital in the island that caters for almost all the severe medical emergencies, and therefore the death rate from asthma could if anything be only marginally higher than the figure quoted.

The corresponding figure for the U.S.A. in 1946 was 2.2 per 100,000 (Tabb. *et al.*, 1968), and 4.24 per 100,000 in the United Kingdom in 1966 (Speizer, Doll and Heaf, 1968) In the Cardiff area, which has a population very comparable to our 300,000, there were 13 confirmed deaths from status asthmaticus in 1951 (Williams, 1953). Between 1960 and 1965, there has been an increase in mortality from asthma in England and Wales (Speizer, Doll and Heaf, 1968). In Malta, as in other countries, such an increase has not been observed. The monthly distribution of cases admitted to St. Luke's Hospital with status asthmaticus is shown in *Table IV*. The lowest admission rate occurred in August and September, with the peak rates occurring in November and December.

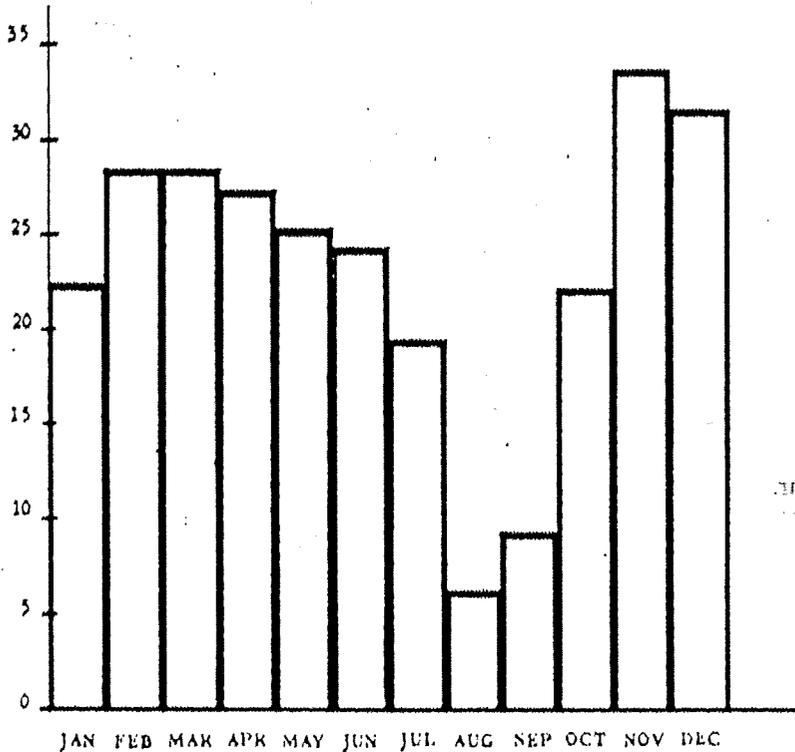
I think it would be of interest to learn

TABLE 3
Mortality
and
Distribution of Cases of Status Asthmaticus
(1964 - 1968)

Age	1964		1965		1966		1967		1968		Age, Group	Total
	M	F	M	F	M	F	M	F	M	F		
0 —	3	2	6	4	3	—	—	—	8	3		29
10 —	2	1	6	3	2	2	2	3	2	2		25
20 —	—	3	3	3	—	3	—	2	1	4		19
30 —	—	3	2	8	—	1	—	2	2	3		21
40 —	—	2	—	3	—	2	1	1	5	11		25
5/ —	4	1	4	4	6	4	13	3	13	3		55
60 —	2	6	11	2	7	5	8	6	13	3		63
70 +	2	1	5	1	1	3	5	7	9	3		37
Total/Yr	32		65		39		53		85			274
Total/Yr	M	F	M	F	M	F	M	F	M	F		Total
Per Sex	13	19	37	28	19	20	29	24	53	32		
Mortality	1	—	2	1	2	1	—	1	1	—		9

Table 4

DISTRIBUTION OF CASES OF STATUS ASTHMATICUS
PER MONTH DURING 1964-1968



how 11 British asthmatics have fared since they have taken up residence in Malta in the last three years following the introduction of tax incentives to encourage well-to-do persons to take up residence in these Islands. This is shown in *Table V*. The two adolescent female asthmatics improved; one of them was sensitive to house dust and feathers and did very well following desensitisation, the other one still suffers from attacks of asthma but they are fewer and milder. It is relevant that only 3 of the adult asthmatics showed improvement, whereas none of the patients noticed any deterioration of their asthma since coming to Malta. Those patients with associated emphysema showed no improvement at all.

Malta has for a long time been re-

TABLE 5

**Bronchial Asthma in 11 British Residents
(1964-68)**

Case	Patient	Sex	Age	Outcome
1.	F.J.	M	55	No improvement
2.	J.B.	M	56	Better
3.	K.A.	M	59	Better
4.	J.H.	M	61	No improvement
5.	J.K.	M	62	No improvement
6.	H.J.	M	64	No improvement
7.	L.B.	M	72	Slightly better
8.	J.W.	F	14	Much better
9.	H.L.	F	18	Better
10.	H.F.	F	52	Better
11.	R.W.	F	56	No improvement

commended as a health resort for invalids and since the early part of the nineteenth century, invalids — especially those with pulmonary disease — have come to winter in Malta. In his book "Notes and Observations on the Ionian Islands and Malta" published in 1842, John Davy, brother of the inventor of the miner's safety lamp, who happened to be Inspector General of Army Hospitals, wrote that the climate in Malta may be beneficial to the invalid suffering from chronic bronchitis or "from some obscure affection of the lung coming under the vague designation of asthma". Penry Williams in his "Recollection of Malta, Sicily, and the Continent" published in 1847, also recommended Malta for the invalid as being at least equal, if not superior, to most other health resorts in the South of Europe.

I think one can confidently advise the asthmatic patient who plans to come to Malta that his condition may or may not improve but it is unlikely to get worse.

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GLUCOSE-6-PHOSPHATE DEHYDROGENASE DEFICIENCY IN MALTA

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Summary: In a survey carried out to establish the incidence of G-6-PD deficiency in Malta, a total of 1514 samples were tested by the brilliant cresyl blue screening method. 2.7% of the male and 1.9% of the female population were found to be enzyme deficient. Of the 295 samples tested by the quantitative assay, 22 were found to be enzyme deficient, and half of these showed an enzyme activity of less than 10% of the normal, and in the other half the activity ranged between 10 and 25%.

Glucose-6-phosphate dehydrogenase deficiency is a hereditary enzyme defect that is linked with the X-chromosome and becomes manifest in heterozygous males and homozygous females with a varying degree of expression. Two main variants have been recognised: that found in Negroes and that found in Caucasians. Affected individuals in the last group are specially prone to favism and neonatal haemolysis.

In view of the high incidence of G-6PD deficiency in Mediterranean countries, such as Italy (W.H.O. Report 1966), Greece (Stammatoyannopoulos, G., *et al.*, 1966) and North Africa (Vergnes, H., 1965), it was considered useful to establish the frequency of this congenital deficiency in the Maltese population. Malta has a population of only 318,000 and consequently, consanguineous marriages are relatively common, though precise figures are not available. It was therefore expected that the gene frequency in the local population

would be high. G-6-PD deficiency is reputed to confer a selective advantage to heterozygotes with regard to malaria in countries where it is endemic (Motulsky, A.G., 1964). In this connection, it is relevant to point out that malaria was endemic in Malta until about the middle of the last century (Cassar, P., 1964).

A definitive survey of the Maltese Islands was carried out in order to detect deficiency of G-6-PD in erythrocytes using a screening method. A quantitative assay was used to confirm the positive results obtained by the screening test. Several cases presenting with the clinical picture of a haemolytic disorder, and their near relatives, were also investigated by the quantitative method.

The results of these two series of observations are recorded in this presentation.

Methods

1. The brilliant cresyl blue dye test of Motulsky was used in the screening procedure, as recommended by the W.H.O. Scientific Group Report (W.H.O. Report, 1967).

This test is based on the principle that NADP is reduced to NADPH by G-6-PD in the presence of Glucose-6-phosphate, and added brilliant cresyl blue is decolourised. With normal blood, decolourisation occurs within 40 to 60 minutes. Decolourisation times falling between 65 and 90 minutes were interpreted as indicating mild deficiency, and decolourisation times longer than 90 minutes as indicating a severe degree of enzyme deficiency.

All the samples of capillary blood were tested within 1 to 2 hours.

2. Quantitative assay of G-6-PD in erythrocytes depends on the increase in absorbance of U.V. light at 340 $m\mu$, by NADPH which is generated during incubation of a buffered red cell haemolysate with substrate containing G-6-P, Mg^{++} and NADP. The results were related to the values obtained in normal controls, and were expressed as a percentage of the mean normal enzyme activity.

Results

In the survey, 1514 blood samples were tested; of these 1145 were males and 369 were females, and were obtained from the following three groups of subjects:

(a) normal healthy children attending various schools,

(b) hospital patients suffering from various medical or surgical conditions, and

(c) patients attending the diabetes out-patient clinic of the hospital.

Table I shows that 31 male subjects had a decolourisation time longer than 65 minutes — an incidence of 2.7%. There was no difference in the incidence of enzyme deficiency between these three groups. Of the 369 female subjects tested, 7 had a decolourisation time longer than the normal — an incidence of 1.9%, but in none was it longer than 90 minutes.

Because of the heterogeneity of the Maltese population, it was considered advisable to analyse the various groups on a socio-geographical basis to find out whether there existed any local variation in the incidence of G-6-PD deficiency. As shown in Table II, rural areas with a high

TABLE I
Incidence of G-6-PD Deficiency

Males	No. Examined	No. Affected (BCB Decolourisation Time)					
		65 - 90 mins.		Over 90 min.		Total Incidence	
		No.	%	No.	%	No.	%
Healthy	842	11	1.3	15	1.8	26	3.1
Hospital patients	186	—	—	3	1.6	3	1.6
Diabetics	117	—	—	2	1.7	2	1.7
	<hr/> 1145 <hr/>	<hr/> 11 <hr/>	<hr/> 1.0 <hr/>	<hr/> 20 <hr/>	<hr/> 1.7 <hr/>	<hr/> 31 <hr/>	<hr/> 2.7 <hr/>
Females							
Healthy	86	—	—	—	—	—	—
Hospital Patients	58	1	1.7	—	—	1	1.7
Diabetics	225	6	2.7	—	—	6	2.7
	<hr/> 369 <hr/>	<hr/> 7 <hr/>	<hr/> 1.9 <hr/>	<hr/> — <hr/>	<hr/> — <hr/>	<hr/> 7 <hr/>	<hr/> 1.9 <hr/>

TABLE II
Incidence of G-6-PD according to region

Locality	Type	Total examined	Sex	Affected	Incidence
Floriana	Urban	125	M	3	2.4%
Mellieha	Rural	204	M	3	1.5%
Nadur, Gozo	Rural	105	M	6	3.6%
Zebbug, Gozo	Rural	56	M	0	0%
		68	F	0	0%
Private School	Mixed	175	M	3	1.7%

rate of intermarriage do not show an increased incidence of G-6-PD deficiency when compared with an urban population or a mixed population of school-children.

Table III shows the results of the quantitative assays carried out. Of the 295 samples tested by this method, 22 subjects were found to be enzyme deficient, i.e. the activity of the sample was more than two standard deviations below the mean normal level. It was also observed that 11 of these, i.e. 50%, had an enzyme activity of less than 10% of the normal, and the remaining 50% showed activities varying between 10 and 25% of the normal mean.

TABLE III
Quantitative G-6-PD estimations

	Male	Female	Total
No. Examined	233	62	295
No. Affected	19	3	22

G-6-PD Activity
(% of normal)

	Male	Female	Total
0 - 10%	11	—	11
- 15%	1	1	2
- 20%	5	1	6
- 25%	2	1	3

The family studies shown in Table IV, indicated that undetectable levels of G-6-PD in the patients examined were accompanied by a low degree of activity in one or other of the parents, as well as in one or more siblings. In one family (Family Mi) a markedly low value in the patient was associated with normal values in both parents.

The large majority of cases presenting with an acute haemolytic episode were admitted to hospital after having eaten the bean *Vicia faba*.

Discussion

The overall incidence of 2.7% of G-6-PD deficiency in the Maltese population revealed by this study, compares with that of neighbouring countries. In Italy, the incidence varies from less than 1% to as high as 35% in the Po district (W.H.O. Report, 1966). In Algeria, the incidence is 3 to 4% (Vergnes, H., 1965). An incidence of 46% has been found in some regions in Greece as revealed by some surveys (Allisan, A.C., *et al.*, 1964), and an incidence of 3.1% in Cyprus (Plato, C. G., *et al.*, 1964).

As has been shown, there is no correlation between a high rate of intermarriage of G-6-PD deficiency in the Maltese population. This seems to suggest that a considerable loss of genes occurs in the homozygous state. It is well established G-6-PD deficiency is one important cause of jaundice in the newborn (Weatherall, D. J., 1960), and fatal kernicterus might be postulated as one way by which limitation of gene multiplication might occur in localities with a high rate of intermarriages. Further studies are required to establish whether foetal wastage is greater in those areas where intermarriages are common.

Reference has already been made to the relationship between G-6-PD deficiency and malaria. However the evidence so far

TABLE IV
Enzyme activity in families of patients with G-6-PD deficiency

Family	G-6-PD activity (as % of normal) in:			
	Propositus	Father	Mother	Siblings
Za	0	33.6	77	28.7 94.5
Du	0	88	68	0, 6.5
Cac	0	109	86	
Bo	0	32	115	
Da	0	57.2	22	53, 43.0
Ga	0	—	39.6	
Cam	0	32.6	7.2	
Mi	13.1	139	255	

is still inconclusive. It is worth noting that malaria was endemic in Malta up to the 19th century, and the *Anopheles* mosquito was described in Malta in 1904 (Zammit, T. and Caruana Scicluna, G., 1905). Though isolated breeding grounds for these mosquitoes still exist to the present day, and sporadic cases of malaria have been diagnosed as late as 1940, malaria does not present an epidemiological problem in Malta.

The pattern of inheritance of the gene responsible for G-6-PD is well established. As the locus responsible for this enzyme is situated on the X chromosome, this condition is transmitted as a sex-linked character, and affects males predominantly, while females carrying one affected chromosome (heterozygotes) show a varying degree of enzyme deficiency. This is also apparent in our family studies where reduced activities were found in 5 of the 8 mothers of patients with G-6-PD deficiency. This pattern of inheritance also shows why the incidence of G-6-PD deficiency found in the survey was higher in males than in females (2.7% for males compared with 1.9% for females) and heterozygous females are not so readily detected. This mode of inheritance also explains why the

clinical effects in females are so much milder. None of the females included in the survey had a decolourisation time longer than 90 minutes, whereas the decolourisation time was prolonged to over 90 minutes in 65% of the male population showing abnormal decolourisation times.

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The two following papers were read in the Session on "Medical Aspects of Tourism in the Mediterranean" at the 12th Annual Clinical Meeting of the British Medical Association, in Malta.

PUBLIC HEALTH ASPECTS OF TOURISM IN THE MEDITERRANEAN

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Is the tourist who ventures to the shores of the Mediterranean exposing himself to greater health hazards than those he meets in his normal environment? Obviously the answer depends on the country he comes from, the country he visits and on his behaviour therein. For the purpose of this paper I will assume we are dealing with the traveller from Britain, a convenient country to choose if for no other reason because of its high standard of health and hygiene. As for the visited place, we are dealing with the Mediterranean countries and these vary enormously. It is no truer to say that typhoid starts at Boulogne than that the niggers do so and I believe many persons have an exaggerated idea about the dangers of town life in Europe. I have been often asked about the safety of tap water in Malta and have been glad to be able to reassure the questioner. Our tap water is hard, it may be salty, the tea connoisseur may consider it unsuitable for a good brew (I knew a pathologist who used distilled water every time), but normally it is perfectly safe. This undoubtedly is the rule for every large town in Europe. We must, however, bear in mind that the Mediterranean has also a Southern, which is an African coast and that this is becoming increasingly popular with tourists.

The third factor, the tourist's own behaviour, is perhaps the easiest to understand. The holiday maker wants his holiday to be a success and a change in his psychology to a euphoric one comes over as soon as he enters Victoria Station or settles himself in an aircraft. A holiday has to be bad indeed for the average tourist to be forced to admit the fact. It is a

good thing for the normal fault-finding citizen to discard this habit which so often spoils his pleasure at home but, like everything else, it can be carried to extremes. I have seen walkers along a mountain side drinking from what they referred to, with a romantic flourish, as mountain streams, when they had not yet got above the cow-line, so to call it, with all that that implies; in fact, they had not even got above the line of the mountain huts with their lavatories. None of these persons would have dreamt of drinking from a puddle whilst at home, and it is a possibility that a town puddle would have been cleaner.

Similarly the tourist tends to be carried away by the appeal of exotic food-stuffs. It will, in fact, be a strong willed person who can resist tasting the varied shellfish on display along the coast of the Gulf of Naples. There are world famous restaurants at whose doors stands the "Ostricarò", the shell fish seller with a most enticing display. If this is resisted one will still come across epic fish soups which look more like an aquarium than a plate of soup, with whole fish and a variety of molluscs in their shells immersed therein. The fish will certainly have been cooked but I can't help wondering how the shells will have been disinfected, if at all. In some countries the laws governing the sale of shellfish are not enforced at all. Standards are laid down to which the shellfish breeder is encouraged to conform, but there is no legal compulsion and one can imagine the standards which some poor fisherman trying to make a living is likely to adopt.

It is a fact that in Italy, for one, the

incidence of typhoid in the coastal towns is definitely higher than in those of the interior. Santopadre, G., and Dell'Omodarme, G. (1958) report that whilst in Vicenza and in Verona only 1 to 5% of enteric cases were attributable to the consumption of shellfish as many as 75% were so attributable in Leghorn and in Savona, on the Genoa riviera. In assessing the intensity of the danger one goes back to the idea of epidemic constitution. The danger through shellfish depends on the incidence of the illness in the country as a whole. In Britain a fair amount of shellfish is consumed and often in the raw state. As is well known oysters are bred specially under safety rules which, in Britain, are observed. I doubt whether such things as whelks etc., often available for a few pence, at such places as Brighton pier, are reared with any special precautions. Still typhoid and the Salmonellosis as a whole are uncommon in England and Wales, but common in some Mediterranean countries. This matches the fact that whilst there were 235 cases of enteric in England and Wales in 1967, of which 137 were typhoid, in Spain there were 3591, in France 1531, in Italy the surprisingly large number of 10,603 and in Malta 51 cases. (World Health Statistics Report, 1968). In Malta I may mention, shellfish are not reared artificially and they are not popular as food with the minor exception of sea urchins and limpets. In these latter cases one has to bear in mind the breeding ground and its relation to sewage disposal points.

One of the great attractions of a Mediterranean holiday — perhaps the chief one for the majority of holiday makers especially from the North of Europe, — is sea bathing and the safety of this is closely bound up with the disposal of sewage and the faultlessness of the normal sewerage system. Again and again the lesson has been taught to us by experience, such as in the Zermatt typhoid outbreak of 1963, that one should always consider mixed sewage as certainly dangerous and therefore the safe rule is to consider bathing in more or less enclosed harbours as dangerous and best avoided. In every resort the medical officials should know precisely what the situation is and the pub-

lic should be warned of danger and bathing should be forbidden in dangerous areas. It would be useful if somebody were to undertake the publication of a guide book which would especially point out sewage effluents, their relation to bathing beaches and the sort of treatment to which the sewage is submitted before being discharged. Many seaside towns tend to keep silent about this and the enquirer is liable to get unpleasant surprises.

One other danger is the consumption of uncooked fruit and vegetables. In Britain, presumably owing to the low general incidence of bacterial and parasitological diseases contracted by ingestion, the inhabitants do not generally trouble to cook or to disinfect such things as lettuce or to peel fruit. To do this is strongly advisable in the Mediterranean area. This is again bound up with the possible use of human excreta as fertilisers. Most countries have laws specically forbidding this, but how far are these laws observed? Fairly generally, I would say, in a small place like Malta where through the size of the country the malefactor can be easily discovered and where surveillance is strict. This is not so easy in many other countries, especially those which do not have an adequate sewage disposal system, like some places in Southern Italy. There are other Mediterranean countries parts of which have not yet reached the necessary standard of health. Ben Rachid and Ben Salem (1968) — writing on intestinal helminthiasis in Tunisia report finding parasite ova or cysts in 2,642 samples of faeces out of a total of 6,219 samples from patients in the Tunis region, which meant 15% of positives in samples from the Tunis region and as much as 50% from the mine regions and from the oases. Some of this, as doubtless of other illnesses, is linked with the use of human excreta as fertilisers which is admittedly done in such areas as Cap Bon and the oases in the South.

The tourist in Tunisia may not find his way to these latter places, but the admission that such customs prevail in one makes one rather wary of eliminating the possibility of their prevailing also elsewhere; and, of course, the vegetable sup-

plies will derive from distant areas. I do not wish to run down Tunisia as a tourist country; it is a very interesting place, a change from the normal environment of most of its visitors and not an unsafe one generally, but it is well that one should know about certain things.

All these considerations have a bearing on two public health measures frequently advised, T.A.B. vaccination before continental travel and completely avoiding the consumption of water whilst abroad substituting it with soft drinks (presumably made with sterilised water) of various kinds or even with wine. With regard to T.A.B. I feel a distinction should be made between tourists and travellers. The tourist wandering around the picture galleries of Florence or idling on the Côte d'Azur is not exposed to the same risks as the venturesome traveller in Iran or in some remote village in Morocco. Doubtless vaccination with T.A.B. is a counsel of perfection which no hygienist can oppose, but is it really necessary under normal tourism conditions? I believe that vaccination will neither absolve the tourist from the necessity of taking ordinary precautions nor will it protect him against the extraordinary danger, such as a fairly massive sewage pollution of a water supply. Therefore it seems to me that whilst reasonable precautions and not T.A.B. should be taken in most places, specific vaccination should be prescribed to the traveller who is likely to leave the beaten track.

As for the drinking of water from any locality, I think a distinction should also be made between the piped water supply of large and small towns and that available in the more remote villages or in mountain huts. Perhaps it is simpler to ban water in general but I do not think this is necessary when one is dealing with a person of average intelligence to whom matters can easily be explained. Obviously accidents can happen everywhere and the hygienic adviser might prefer to play safe but this does not seem reasonable to me. One could easily end up, being logical, by having the conscientious tourist cleaning his teeth with a mess of tooth paste and appelsaft.

A danger to which the tourist is exposed is the contraction of Brucellosis. To put this in the right perspective one notes that this is a far less serious danger than typhoid or dysentery since the illness itself is not as serious and the possibility of one person starting an epidemic is remote. What would make the Mediterranean countries more risky than Britain itself in this connection is the greater possibility of infection with *Brucella melitensis* deriving from goats and possibly sheep rather than with *Brucella abortus* which occurs in Britain. *Bruc. melitensis* is well known to be more infective and to cause a more serious illness. Now we may as well say in the first place that Brucellosis, which used to be known as Malta fever, is now a very remote danger in Malta itself. In Malta we still get a considerable proportion of our milk supply from goats, but we get a large proportion from cows. Even in goats incidence has now decreased greatly. More important than this is the fact that all milk available for consumption in Malta and Gozo is pasteurised. The possibility of getting Brucellosis from cheese cannot be excluded, but there again there are several considerations. Firstly cheese is generally made from the far less susceptible and affected sheep. Secondly most of the locally made cheese on the market is made from pasteurised milk in any case.

Now while the danger of Brucellosis in Malta has long been recognised and has now been effectively dealt with, this may not be the case elsewhere. Brucellosis is known to be widespread along the Mediterranean coast as elsewhere, so the danger is probably greater in Italy (including Sicily), in Spain and in Greece. The situation with regard to pasteurisation varies but it is almost certainly nowhere as good as it is in Malta, and one can come along surprising reports. Maida (1968) reports that to an incidence of 2.4% of brucellosis in cattle in the Rome region, there were a calculated 45.4 per million human cases. What was certainly unexpected was to find that whilst 121 million litres of pasteurised milk were issued for consumption from the Rome central distributing agency, about 20 million litres went

on the market untreated and 45 million litres were issued untreated for cheese making.

It seems that the truth, regrettable only from the point of view of the hygienist who would occasionally like a flash of drama to light up his everyday work, is that the tourist along the northern coast of the Mediterranean is, on the whole running no great dangers and the illnesses he could contract are not likely to be exotic ones. There was a time when the traveller to Rome ran a serious risk of malarial infection. This is no longer so, neither on the Italian mainland nor in Sardinia, nor in Cyprus. But tourism has been expanding and the traveller who has already been to almost every country in Europe is now invading Morocco and Tunisia. Algiers, perhaps owing to the unstable political situation does not appear much in tourist literature, nor does Tripoli which seems understandably more concerned with developing its lucrative oilfields than its tourist potential. It is not easy to get information on the diseases prevalent in Morocco and Tunisia. There was a time when plague was more or less endemic and so were typhus and relapsing fever. Smallpox was also not infrequent, but it appears that the epidemiological picture has changed vastly for the better. One illness which prevailed widely and I think still survives is trachoma. This is an illness which I personally would dread greatly. My ophthalmologist colleagues assure me that it is not a highly infectious disease. They may be right but judging from the widespread evidence of its sequelae, apparent in the eyes of so many passers-by in the streets, it certainly seems a very common illness and, in the fly season, which I am assured (for my own visits to North Africa were in other times,) is very noticeable indeed when these persistent insects settle on

purulent eyes, I confess my faith in an epidemiological assertion would not be strong enough to reassure me and make my stay a pleasant one.

In various parts of North Africa, certainly in Algeria (*Rapport sur le Fonctionnement de l'Institut Pasteur d'Algérie en 1966*) and in Tunisia rabies still exists. In Algeria in 1966, the latest year for which I have been able to obtain figures, there were 26 human cases. In Tunisia between 1964-67 an average of 206 dogs per year were confirmed, by laboratory examinations, to have been suffering from rabies (*Report of the Tunis Pasteur Institute, 1964-67*). So this danger must be borne in mind. So also are there scorpions and venomous reptiles, but here again one must keep a sense of proportion. Certainly North Africa affords risks which places like Malta with their complete freedom from poisonous snakes and scorpions do not present, but such snakes do occur in France and other parts of the North African coast.

"The grand purpose of travel," said Dr. Johnson, "is to visit the shores of the Mediterranean." The tourist who follows the great lexicographer's advice will, with a little bit of luck, find that he can do so with no untoward results and a great deal of pleasure.

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THE MEDICAL HAZARDS OF SKIN DIVING

J. J. SAMMUT

Please allow me to address you not only as doctors who might be called upon to minister to skin-divers in trouble but also as potential skin-divers yourselves.

The amateur skin-diver's dress is often just a pair of bathing trunks, some sort of goggles or mask to protect his conjunctivae and to give him clear vision, with a breathing-tube or snorkel attached for surface reconnaissance. If these are brightly coloured, say orange or red, they warn off water-skiers. A shiny bald head is an advantage. Rubber flippers on the feet give rapid propulsion with the minimum of effort.

There are two main types of mask. The so-called "Pinocchio" type has a single glass across the eyes notched above the nose and enclosed in a watertight rubber face-piece to just below the nose, leaving the mouth uncovered, the whole being strapped around the back of the head. The snorkel in this case is J-shaped, the short end being held in the mouth as the swimmer faces down, the long end ascending along the side of the face. A valve at the top keeps water out on diving. The experienced diver discards the valve, which has a habit of sticking, and uses the tube as a simple blow-hole. Through the soft portion over the nose it is easy to perform the Valsalva manoeuvre under water, though with practice it is possible to clear the Eustachian tubes just by swallowing. Equalization of pressure increases in importance with depth.

A mask usually worn by beginners consists in a large oval glass with rubber frame enclosing the whole face, including the mouth. Breathing takes place through a tube on either side of the mask, each fitted with a valve which cannot be removed without flooding the inside of the mask on diving, thus impairing vision. Still, the beginner here does not have to operate a blow-hole. If neither valve re-opens on surfacing the suffocating swimmer gropes at them blindly to get air, then panics and tries to tear the mask off his

face, but it is tightly strapped to his head. The remedy really is quite simple but must be kept in mind. At the first sign of valve-trouble, an index-finger or thumb is inserted under the lower edge of the mask which is then flung off. Eventually this becomes a reflex action.

A veteran skin-diver tells me that the dress of choice on the way to the beach, especially in cold weather, is *the lightest possible*, to help acclimatization prior to a 3 or 4 hour diving session. Especially when the weather is cold, a tight-fitting rubber suit is worn as a sort of blubber. A woollen vest underneath gives added insulation by virtue of the air enmeshed in it. Smearing the body with vaseline also helps. Long exposure to cold lowers resistance to trauma. A jelly-fish sting at the beginning of a swim is a nuisance but causes no real discomfort; but the pain of a similar sting towards the end of a long diving session can be excruciating and cause very real shock. Simply grazing the knee against the rocks on leaving the water may cause great pain and prostration, whilst a deeper cut might be very well tolerated earlier on.

As in flying, NEVER dive with any of nasal congestion. However deep one dives, so long as internal and external pressures on the tympanic membrane are equal, it will not suffer. At a certain depth, variable with individuals and with the state of the mucosa, external pressure is felt on the drum. If Eustachian tube clearance is unsuccessful, especially if pain supervenes, diving any deeper is courting trouble.

The clinical appearances of the ear following barotrauma from sea-diving are much the same as those from air-diving. In mild cases of barotrauma the drum is merely injected, next, capillary haemorrhages may confluence and cause bruising between the drum layers, sometimes blistering the epithelial outer layer. If the drum remains intact and is reasonably transparent, a haemotympanum of the

ear might be observed. In extreme cases the drum may rupture.

During swimming deep sensibility through the feet is eliminated and at a certain depth, even through a mask, range and field of vision are restricted. This leaves only one means of orientation, namely the static labyrinth. A sudden inrush of cold water through a perforation temporarily knocks out this organ as well. In such a predicament, the diver should rid himself of any excess weight, not struggle, and trust to natural buoyancy.

The short term local treatment for this type of perforation is NOTHING. Nasal decongestants might help and full doses of a broad-spectrum antibiotic *systemically* might combat secondary infection. Drops of any sort into the ear itself are contraindicated. If left alone, and the patient does not blow his nose (or go diving) for a few days or weeks, the drum will heal, any blood resorb and hearing return to normal. A haemotympanum is usually limited to the hypotympanum, far away from the "works" of the middle ear, so to speak, but if it fills the middle-ear cavity and causes the drum to bulge, a paracentesis under the strictest asepsis is indicated.

Barotrauma can also affect the paranasal sinuses. Anybody who has had an acute sinusitis, or even just a stuffy nose, may have experienced a splitting headache on bending the head down, the pain being referred to ears, teeth, eyes and the whole skull. This is more marked on diving head-first. If a diver notices any of the above symptoms, he should right himself immediately and call off diving for that day. The same symptoms may occur during an ascent, when air trapped under pressure in one or more head cavities cannot escape quickly enough through a congested ostium.

In recent years the really large fish, like groupers, have had to be sought ninety or more feet down. Considering that each thirty feet of water has the pressure of an added atmosphere some idea is had of what some enthusiasts let themselves in for.

As a rule, accidents happen either as

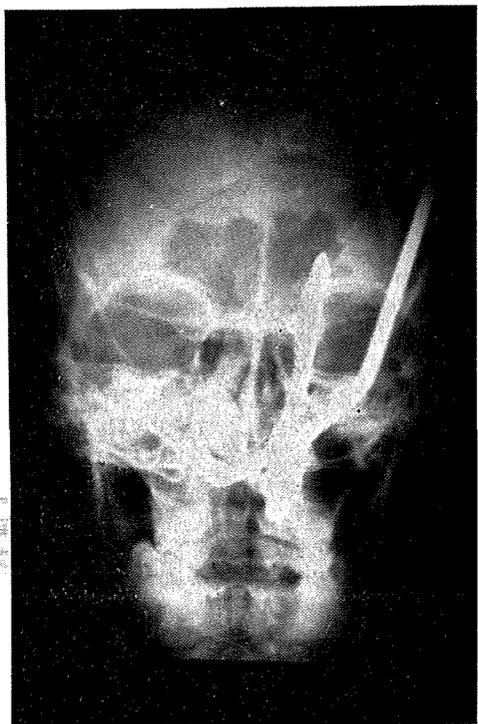
the result of a sense of rivalry or out of an exaggerated sense of loyalty to a partner or team. Numerous examples could be cited. Here is just one: early on in the 1961 International Subaqua Fishing Competition, which was being held in Malta waters, the then Malta champion was just about to surface, but had not quite, from a sixty foot dive after having captured a very large and heavy grouper, when he dropped his harpoon gun. As time was precious he turned over again, without surfacing, and dived, grouper and all, to recover his gun from the bottom, a much greater depth than that at which he had just been. He did get his gun, but reached the surface in a collapsed condition, and had to be taken ashore at Gozo for treatment. As a result, the Malta team was one man short for most of the contest, and a major tragedy was averted only because of the diver's youth and general good health.

This brings us to another hard and fast rule: *never* go diving if feeling even the slightest bit "off sorts" or after a full meal.

As a sport, the "game" is naturally fish, the weapon having evolved from a simple spear, through various types of spring and compressed air guns, to the sophisticated cartridge rifle. The shaft may have a single barbed point or end in a three pronged fork. Whatever its make, a gun is liable to go off accidentally, and when carried on shore it should be held pointing downwards at all times. The X-ray picture shows a young man who disregarded this fundamental rule. By the most fantastic good fortune no injury was done to eyes, brain, or any other important structure. He presented a very macabre picture on admission to hospital with this great big harpoon growing out of his face. Under general anaesthesia the shaft was sawn off near the trident which was then skilfully removed by Professor V. G. Griffiths. I think one stitch was put in somewhere and he was discharged the next day.

One of the first rules of any subaqua club or team anywhere is that divers must always go out in twos, so that each can keep an eye on the other. It is wise to hold

one's gun pointing away from one's partner.



When the shaft leaves the gun, several yards of cord are paid out, and it would not be impossible for a diver's leg or arm to get entangled by it around some projecting rock, and a sharp knife is usually carried in a sheath against this or any other eventuality.

Malta waters are fortunately free from the really dangerous denizens of the sea. The odd shark sometimes fouls the nets of regular deep-sea fishermen, but within living memory, with one possible exception, a shark has never attacked a human. The moray-eel does exist here but no skin diver has ever been attacked by one. The sting-ray, a flat square cartilaginous fish with a ropy tail growing out of one corner, glides along sandy bottoms; it can inflict a very severe sting with its tail, but only if interfered with, and it is a sitting target to any spear-fisherman. Sea urchins are no problem because the diver can always put hands or feet down under direct vision. A jelly-fish sting can be rather unpleasant but not serious. These medusae invade an area in shoals,

suspended a few inches below the surface. It is fairly easy, if you see one coming, to squash it between your two flippers. For the actual jelly-fish sting, some local or systemic antihistaminic helps, but usually the burn wears off on its own.

For the diver who would like to spend longer periods submerged than his own lungs will allow, the Aqualung is available. This consists, in the case of amateurs, of one or more compressed air cylinders strapped to the back and connected by breathing tubes to a mouth-piece. (Professional divers use varying mixtures of Oxygen with Nitrogen or even Helium.) The deeper one dives, and the longer one stays under, the more nitrogen is accumulated in the body. As long as this is under pressure it is held in solution in the body fluids, But, should the diver who has been submerged long and deep suddenly have to surface, nitrogen is released as bubbles of gas, which, if not eliminated by the lungs in time, may give rise to embolisms in joints, heart, lungs or the central nervous system — the dreaded "bends" of caisson disease — which, if not dealt with immediately, may cause permanent crippling or even death.

Therefore —and this is vital — unless an aqualung has been declared by an expert to be in perfect working order, it is on no account to be issued to, or accepted by, a diver.

The staging of an ascent is governed by a set of rules based on the depth and duration of dives. There is no time for details here, but as examples: for a dive of 2 hours at 60 feet, half an hour is required for the ascent and for a dive of 4 hours at 60 feet, one and a half hours are necessary. If a diver does fall victim to the bends, one or two things, or both, should be done with the least possible delay: either (i) he is taken down again, with aqualung, to his original depth and helped to surface by stages, or (ii) he is taken to the nearest compression chamber if one is available. This is an air-tight chamber inside which the air-pressure (or other breathing mixture) can be raised or lowered as necessary. In Malta we are grateful to the Fleet Clearance Diving

Team of the Royal Navy who are always ready with their advice and practical assistance. In the chamber, a diver can be subjected to air compression equivalent to that of the depth at which he has been and then decompressed by corresponding stages.

When a series of tiny bubbles are seen rising in the sea and popping at the surface, they usually indicate the position below of a diver using a normally-functioning aqualung. But, if the bubbles are large and follow each other in quick succession, they are issuing directly from the aqualung mouthpiece, no longer held in the diver's mouth, and this spells trouble. In such a case, the diver, who is probably unconscious, is located immediately, an aqualung mouthpiece applied to his mouth, and he is raised as quickly as possible to the surface. Life-saving here takes priority over the prevention of bends. Mouth-to-mouth respiration is given immediately on reaching the surface, whilst still in the water. At the first convenient place, on a boat or on land, manual artificial respiration is administered, the method of choice being that with which the operator is most familiar. Naturally a free airway is a "sine qua non" and if water has been inhaled the victim had better be in the prone position. Cardiac arrest is treated by cardiac massage and cardiac stimulants, such as

intracardiac adrenaline.

To conclude on an optimistic note. Diving accidents are rare and mostly avoidable, and the prizes well worth trying for. Cousteau's "silent world" can be a veritable paradise for those under its spell. There is no necessity for slaughtering fish: there are other, more fascinating, things to see and do. For hours one can be held spellbound just gazing at the configuration of the rocky deep and shelves, the variegated shapes and colours of the sea vegetation and the varieties and behaviour of the fauna. For instance, the commensalism between pen-shells and their sentinel crabs, the jet-propulsion of clams and squids, the screw-action by which certain sea-snails bury themselves in the sand, the gentle grace of the nudibranch literally flying through the sea and numberless others.

This is to say nothing of the thrills provided by spotting Phoenician, Roman, or mediaeval potsherds half buried in the sand, and, who knows, perhaps even the odd anchor from a foundered galleon of bygone days. In fact, so long as the rules are observed, skin diving is a safe and exhilarating form of occupational therapy strongly recommended for the harassed medical practitioner.

TRAFFIC INJURIES IN MALTA — SOME CONSIDERATIONS AND SUGGESTIONS

By V. T. CAMILLERI
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This paper was read at the 12th Annual Clinical Meeting of the British Medical Association in Malta.

A grievance I always have is on the question of education, and this is the most important point of all. I am not going to be involved in a political speech as I have nothing to do with politics, but coming back to the present day I believe that we as a country have failed to educate ourselves up to our improved standards of living. I do not think that people today who are enjoying better conditions of life make the best use of their improved conditions. Not only have we failed in that respect, but we have failed miserably, to my mind, with the education of the driver.

(R. Priestley "The Vehicle and the Road" — Medicine, Science and Law. Oct. 62)

I would like to preface my remarks by saying that I am chiefly interested in seeing how far, and in what way, local conditions affect the incidence of traffic injuries in Malta, and, at the same time, to make some tentative suggestions for their control.

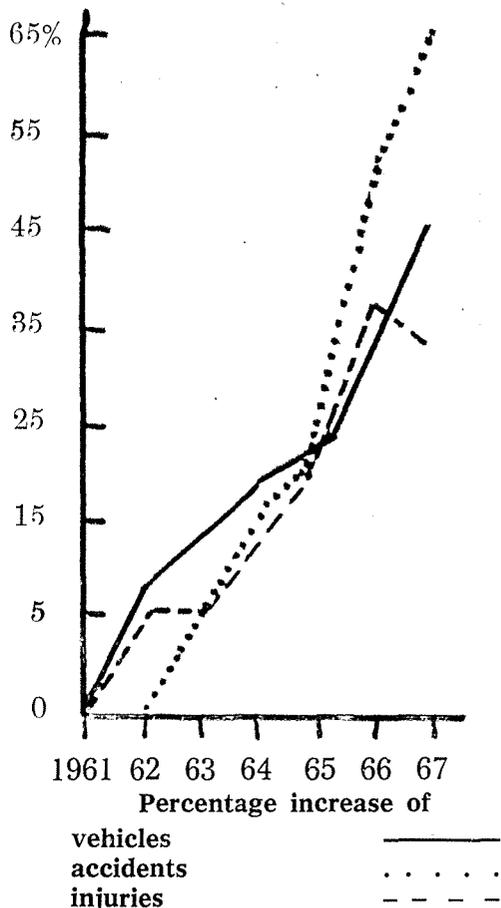
The very great and rapid increase in traffic which has characterized these last few years reflects the increased tempo of living in Malta; and as this, far from decreasing, appears to be becoming still more intense, it is justifiable to expect with it a further increment in the volume of traffic, and with it an increase in the number of traffic accidents and injuries. Unfortunately, it is beyond human power to eliminate them completely, and all we can do is to try to bring them down as

much as possible. This it is our duty to attempt.

During 1967, excluding service transport and an unknown number of bicycles and horse-drawn vehicles, there were 40209 motor-driven vehicles on the road as against 26880 in 1961, an increase of 50%. At the same time the total number of accidents rose by only 32% that is from 589 to 781 (fig. 1). This number includes injuries arising from accidents involving bicycles and horse-driven vehicles as well.

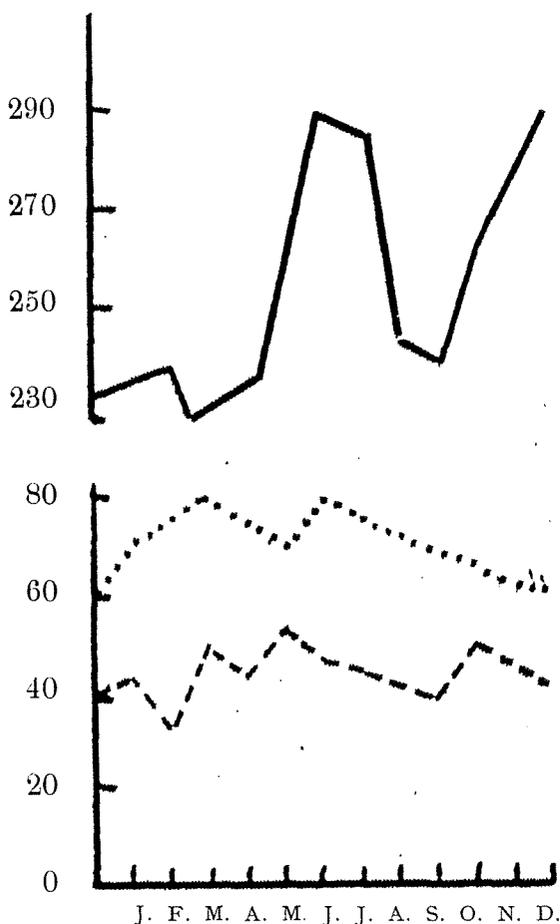
Of the three curves, that showing the total number of accidents is the highest, whilst that showing the number of injuries

Fig. 1



is the lowest. The crude figures here given do not, however, show the real relation between accident and injury: first because accidents not causing personal injury are not recorded as they are often settled out of Court; secondly because the figures available do not show, either the number of such accidents, or the number of casualties in any one accident. Thus, in 1967, which is the only year for which any sort of analysis could be obtained, out of 3140 accidents registered only 602 caused personal injury, and there were 781 casualties (Fig. 2).

Fig. 2



Accidents and injuries in 1967

- Total of Accidents ———
- Accidents involving personal injury - - - -
- Number of injuries

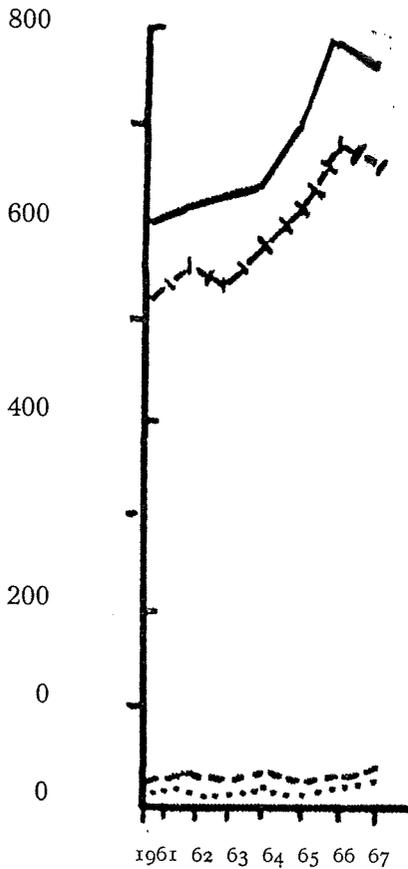
According to our Criminal Code injuries are classified as slight, grievous and fatal. Fatal injuries are those that are followed by death, whether immediate or not; grievous are those that (i) endanger life; (ii) penetrate one of the body cavities; (iii) disable an individual for a period longer than thirty days; or (iv) are followed by a permanent disfigurement or permanent disability. All the rest are slight in nature. Fig. 3 shows the incidence of each category as compared to the total number of accidents. It is interesting to note how closely the slight injury curve follows that for total injuries, whilst the curves for grievous and fatal injuries lag far behind at the bottom of the graph, with only slight variations for each individual year.

If, without excluding the fact that even a slow moving vehicle may cause grievous and even fatal injuries, it is admitted that slight injuries are more likely to happen in slow moving traffic, it would seem that congestion on the roads, rather than speed, is one of the main factors in the causation of injuries.

This appears to be borne out by the distribution of injuries during the twenty-four hours; they occur with greater frequency during the rush hours, when the streets may be said to be saturated rather than only congested with traffic (Fig. 4). The significance of the short and small rise which occurs between 1 and 2 a.m. is not clear as no data for previous years are at hand, but may become so within the next few years. Most probably it is to be associated with a night life that is becoming a regular feature of the Malta scene; but, whether it is due to the increased consumption of spirits accompanying it, or simply to faster driving on emptier and apparently safer roads remains to be seen.

The 781 casualties occurring during this year were made up as follows: 241 passengers, 291 drivers and 249 pedestrians with 5, 10 and 9 fatalities respectively. But, whilst pedestrians were more frequently injured in the under 10 and over 60 age groups, drivers figure more frequently in the 11-60 groups. The 11-20

Fig. 3



Incidence of injuries from 1961 to 1967

Total number	—————
Slight injuries	- - - -
Grievous	- - - -
Fatal injuries

groups are intentionally included in the driver section so as to include a fair number of cyclists, an unknown number of unauthorised drivers, and all those individuals who have just obtained their driving licence, as these three classes contribute a good number of both accidents and injuries (Table 1).

The distribution of injuries by age groups among passengers, drivers and pedestrians, expressed as a percentage of total injuries, is shown in the accompanying table (Fig. 5).

On the whole this may be said to follow closely what happens in most other

places. In one respect however, it will be seen that the pattern differs radically. Everywhere, except in Singapore, (W.H.O. Chronicle 1968) the road death rate has risen considerably, and in at least 15 other countries it has more than doubled itself. Here it has remained at a consistently low level, in spite of the much bigger number of cars on the road.

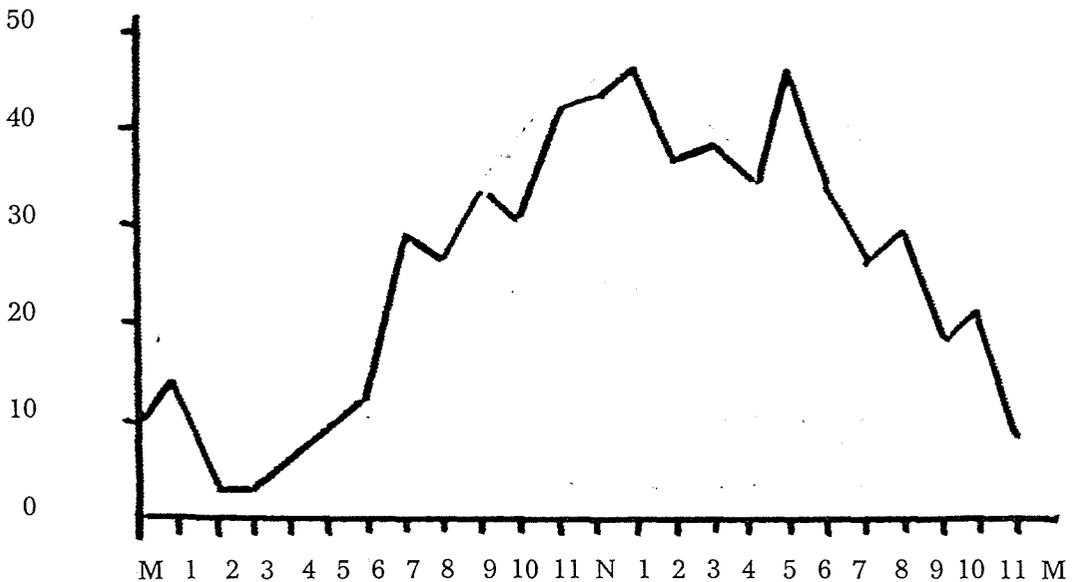
Table 1
Traffic injuries by age group

Age Group	Passengers		Drivers		Pedestrians	
	Total	Fatal	Total	Fatal	Total	Fatal
0-10	15	-	3	-	99	3
11-20	72	3	39	2	54	-
21-30	83	2	111	5	21	-
31-40	31	-	37	1	11	-
41-50	19	-	28	1	10	1
51-60	14	-	16	-	16	2
61-70	2	-	6	1	20	1
71-	2	-	1	-	18	2
	<u>241</u>	<u>5</u>	<u>291</u>	<u>10</u>	<u>249</u>	<u>9</u>

Two factors, one topographical, and the other meteorological, probably account for this relative immunity.

Roads like ours, with their short straight stretches, frequent intersections and a turning just ahead do not allow any really high speed. Certainly, they can be a trap for the unwary, or for the driver unfamiliar with the locality; equally certainly accidents do happen through injudicious driving, but only occasionally are these accidents of any serious entity and, more often than not, one gets away with a bad shaking and a dented car. Moreover, because of these short distances, there is no such thing as long distance travel; and, except for buses, heavy duty traffic is practically non-existent after sun-down. The result is that rarely, if ever, does one come across an accident which can be ascribed to either mental or physical fatigue. We have no snow and no fog, and rain is too rare a commodity to interfere with safe driving. One is even tempted to say that our greatest meteorological hazard seems to be the mildness of the climate which allows the streets to be used as a playing ground by

Fig. 4



Distribution during the 24 hours of the 602 Injury-causing accidents which occurred in 1967.

children.

And yet, in spite of these natural advantages, and in spite of the undoubted improvement of our roads together with the adoption of other protective measures, accidents are still happening, and people are still being injured with disquieting frequency. The truth is that we are not prepared for the traffic that there is on our roads. It has come upon us so suddenly and increased so rapidly that it has found us unprepared for it, not only without any of the protective measures that have grown up with it elsewhere, but, worse still, with a public that neither realizes the danger that these new conditions have created, nor appreciates the usefulness of the measures that have been taken for its protection. Without the cooperation of the public this is a problem that cannot be solved, as it is man who is the determining factor in any one accident. Time, place and circumstance certainly contribute their share; chance takes a hand in bringing them together, but it is man himself, whether driver or pedestrian, who determines the matter.

And, more often than not, either through selfishness or carelessness.

Officially, 31 different causes of accidents are recognised, and a look through this list (Fig. 6) will show that most accidents can be ascribed to either one or the other attitude. Unfortunately, however, because of the vagueness and ambiguity of the descriptions given it does not go much beyond this, and is quite insufficient as a guide as to why and how accidents do happen in Malta. One particular term is however to be deplored as it is of serious import: attributing an accident to "driving in a drunken state" implies that the role of alcohol as a contributory cause of accidents is not fully appreciated, and that it is not realized that drink starts affecting driving capacity adversely much before it starts showing its effect as manifest drunkenness.

It would not be amiss here to point out the inadequacy in general of the available traffic statistics, which deprives us of much useful information. For their proper evaluation the crude figures given should be broken down further. It is also

important to know the exact site where accidents have happened, preferably indicating it on an appropriate accident map, and not contenting ourselves with the present anachronistic division of the Island in urban, suburban and rural districts. As things are today, very few localities are left that can be truly called rural, and with the amount of building that is going on all over the place they will become even more difficult to find, and this will undoubtedly influence the future accident rate. Nothing so ambitious as a research centre is being envisaged, but an earnest plea (which is the only justification for the foregoing remarks) is being made for

fuller and more informative statistics, as without them no real progress is to be expected. There can be no doubt that, even from an economical point of view, such an expense will, in the long run, prove to be a good investment.

As has been pointed out this list, in spite of its deficiencies, does show that an element of human error is to be found in every accident. The natural inference is that although road improvement and all other traffic control devices are necessary and should form an integral part of any scheme for the prevention of accidents they are by themselves insufficient to bring about a radical improvement as

Fig. 5
Distribution, by age groups, of injuries among passengers, drivers and pedestrians expressed as percentage of "total casualties".

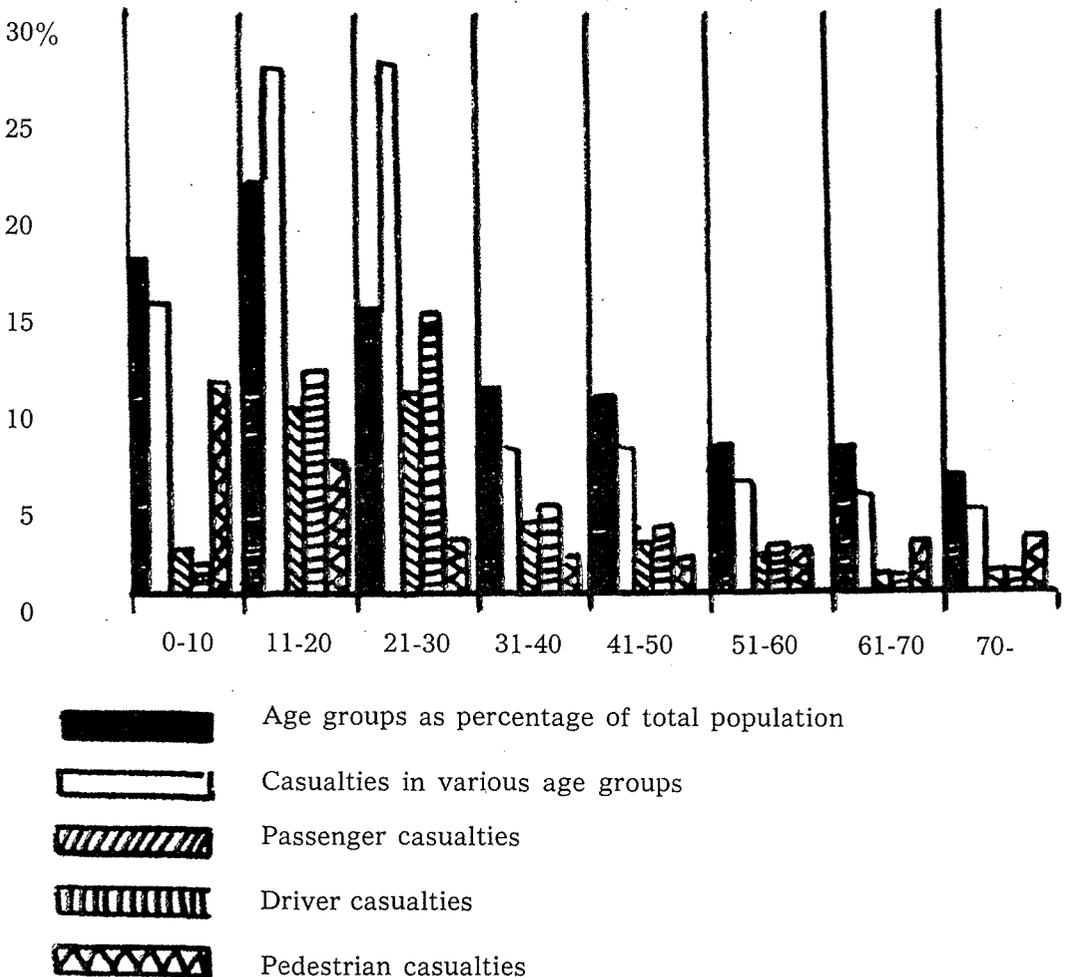


Fig. 6
Causes of Road Accidents

(from the Quarterly Digest of Statistics)

Accidental
 Animal running astray/bolting
 Boarding vehicle in motion
 Brakes, failure to apply
 Collision
 Driving: wrong side of the road
 middle of the road
 too close to other vehicles
 in drunken state
 dangerously
 negligently
 excessive speed
 Dazzled by lights/sun
 Falling from vehicle
 Fire in vehicle
 Heedless of traffic
 Horn, failure to sound
 Lights, vehicle without lights
 Losing control of vehicle
 Mechanical defects
 Misjudgement
 Narrowness of road
 Obstruction
 One way traffic rule
 Overtaking
 Overturning
 Reversing
 Signals, failure to obey
 Skidding
 Swerving
 Traffic block.

“it is quite useless putting them into operation, unless the people who are going to use them are trained to understand, to read them and to operate them successfully” (Priestley).

Educating the public is at least equally necessary, and should proceed *pari passu* with the other measures adopted.

Propaganda of the right sort, instructing in the proper use of the road, showing the need of greater cautiousness and more courtesy and, at the same time, stressing the moral and civic responsibility of road users is certainly a step in the right direction and should be utilized to its fullest possible extent, but it is not enough. To be really effective it should be directed to the child who is still in his formative years,

as by the time an individual has reached the age entitling him to a driving licence he has already become set in his habits and ways of thinking, and is hardly likely to be much influenced by any sort of propaganda. It should aim at educating and not merely instructing, teaching the rules of the road and the more technical aspects of road safety at the same time that it instils the need of self-discipline and respect for others, thus giving the child a basic foundation upon which to build that traffic mindedness which is the surest safeguard on the road. Nor should it be haphazard and left in the hands of the first comer, but it should be entrusted to people who know what they are saying, and know how to say it.

In the meantime, to reduce this wastage of lives, time and money, stricter enforcement measures are to be adopted against the two sections of the population more directly involved, the driver and the pedestrian.

Pedestrians accounted for 249 casualties in 1967. Of these 99 were children under ten years of age as against 38 individuals over sixty. This large number of child victims, 39% of all pedestrian casualties, is a phenomenon that is partly sociological and partly environmental in character. Wiener (1967) considers the child as being “not a true pedestrian, but an undersupervised individual”, and disrupted homes and economic necessity are given as the main reason for this lack of supervision. With us, however, it is to be found in the largeness of our families and the smallness of the houses, with the consequent overflowing of the children, even toddlers, into the street. Up to a certain point, this should make the solution easier to find, and the provision of communal playing fields should go a long way in getting many children out of harm's way. Unfortunately however, lack of space and lack of funds are difficult obstacles to overcome, and it is only through high level cooperation that such an objective can be attained. Here again, both effort and expense would be more than justified if even one accident is prevented, and only one life is saved.

The older pedestrians present an altogether different problem. The child most often becomes a victim because he is not aware of the danger; the adults and the elderly because they ignore it. It seems as if, in assuming the role of a pedestrian, a person refuses to realize the danger of challenging the motor car in its own domain, and, perhaps because of distraction or mere bravado on the part of the adult, or just because of simple failure to adapt himself to present day conditions in the case of the elderly pedestrian, he will try to cross the road with all the cards set against him "heedless of traffic signs and enforcement symbols'.

Wiener's dictum that "there is no notion more fanciful than trying to enforce pedestrian traffic control" applies with particular force here. In fact out of the 249 pedestrian casualties mentioned fully 166 were, on *prima facie* evidence, considered to be attributable to some act done by the pedestrian himself (Table 2). It is true that 103 of these cases occurred in children under fifteen, but the fact remains that, in something like 13% of pedestrians injured, the adult pedestrian has himself taken an active part in bringing about the accident. It may be that he would become more careful if he were made to share with the driver not only the responsibility for the accident, but also the penalty for his transgression, and thus be made to realize that, besides the right to use the road, he has also the duty to use it properly with due regard to his own safety and that of others.

Table 2

Pedestrian casualties considered attributable to the pedestrians themselves

Age group	Number	Percentage of	
		total casualties	pedestrians casualties
0-15	103	13.1	41.3
16-50	27	3.4	10.8
50-	36	4.5	14.6
	166	21.0	66.7

This, however, should not be taken to mean that the responsibility of the driver is thereby lessened. It still remains the greater of the two, because a great deal depends on him as a driver. The car is a potentially lethal weapon, and as such should be handled with great care; and yet it is quite often used not only with unjustifiable levity, but with a total disregard of its dangerous qualities. This is probably why driver casualties are much commoner among younger individuals, as those character traits which influence adversely a person's aptitude for driving have not yet been tempered by experience. Tests have been devised to identify in an individual such traits, thus enabling us to sort out a class of what may be called "unsafe drivers", and it has been suggested that such persons should not be allowed to drive. Apart from the fact that we are not in the position to carry out such a suggestion, one wonders how far it is justifiable to withhold, on purely hypothetical and still debatable grounds, a licence because of an accident that has not yet happened, but may happen at some future unknown date.

It would be more reasonable, and certainly more consonant with economic considerations to try achieving a greater degree of security through a greater amount of control, by being more stringent in the issuing of licences in the first place, and adopting more effective sanctions thereafter.

Driving tests should be severer, more driving ability being required than is at present considered adequate; the compilation of a standardized set of rules of the road suitable to present day conditions is desirable, and a good working knowledge of these rules should be made compulsory for obtaining a driving licence, at the same time raising the age at which a person is authorized to drive heavy duty vehicles and public service transport.

The withdrawal of licences should be resorted to more frequently particularly in accidents involving personal injury, and the imposition of fines, which has no deterrent effect whatsoever on such cases,

be limited to ordinary contraventions. At best, no type of sanction can have a deterrent effect as an accident is an event that happens against one's will, but the possibility that his licence may be withdrawn may instil in the driver that degree of cautiousness which will prevent the accident from happening. Naturally, the period of suspension should vary with the gravity of the occurrence, but cases of gross negligence, as well as frequent and repeated transgressions, showing a wilful disregard of regulations, are to be treated with a greater severity, whilst actual imprisonment should be imposed on all those cases where appropriate tests indicate that drink has been a contributory factor in the causation of the accident.

To sum up therefore, it would seem that whilst the congestion on our roads is the main cause of the majority of these accidents, lack of appreciation of the rules of the road is an important contributory factor, whilst the low grievous injury and mortality rates are more likely attributable to the topographical and meteorological conditions mentioned. The administrative measures outlined are meant to control the situation temporarily;

but, for the effective prevention of these happenings reliance is to be placed on two equally important measures: first, the separation as far as possible of driver and pedestrian; and secondly the education of children from an early age. Finally, the plea for fuller and more informative statistics is again made with the greatest possible earnestness, as it is only through them that we can know whether the measures adopted are bearing fruit and whether we are going in the right direction.

I wish to thank the Commissioner of Police for allowing me the use of his records; Dr. Franz. Saliba for his help in collecting the data for 1967; and Dr. Jos. L. Grech for his invaluable advice.

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MEDICAL STANDARDS OF FITNESS FOR DRIVING IN MALTA

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Summary: The arrangement in Malta whereby every applicant for a driving licence is examined by a medical practitioner and any "abnormal" case is referred to the Chief Government Medical Officer for advice is described.

The classification of licences and the categories of drivers are given.

The fitness standards required for driving are discussed.

The periodic medical examination of public-service vehicle drivers is recommended.

The Motor Vehicles Regulations, 1948, require that an applicant for a licence has to be examined by a qualified medical practitioner who certifies on a prescribed form the driver's state of physical and mental health. Apart from standards of hearing and vision which have been worked out by the Chief Government Medical Officer and circulated to all practising doctors, the examining physician is at liberty to form his own judgement as to the applicant's fitness to drive. Any abnormality or disability found on examination, however, has to be indicated in the medical certificate and these "abnormal" cases are referred invariably by the Commissioner of Police to the Chief Government Medical Officer for advice. As a consequence of this policy, a dossier of such cases has been building up throughout these last eight years and certain rules or guide-lines on physical disability, mental disorder, cardiac disease and other conditions have emerged.

Licensing

The Licensing Authority in Malta is the Commissioner of Police who is empow-

ered under the Motor Vehicle Regulations to issue, renew or revoke a driving permit. There is no specific law which states that certain medical conditions are incompatible with the issue of a driving licence. But there is a general provision which enables the Commissioner of Police to "revoke any driving licence if he is satisfied that the holder thereof is unfit, on any medical grounds, to drive, without risk to himself or to the public, any motor vehicle....."

Categories of Drivers

In Malta, there are five groups of driving licences, namely:

Group No. 1 — Private Car

— authorises holder to drive light cars, vans and trucks; in specific cases, however, it may relate to one type of vehicle to the exclusion of the others.

Group No. 2 — Motor Cycle

— covers also motor scooters and lambrettas.

Group No. 3 — Special

— authorises holder to drive garage-hire cars and taxi-cars.

Group No. 4 — Motor Omnibus

— authorises holder to drive public-service vehicles and vehicles falling under Group No. 1.

Group No. 5 — Private (Handicapped Persons)

— authorises holder to drive one specific car specially adapted to suit his disability.

It is a workable classification fairly representative of the types of vehicles on the road and there is no compelling need to change it other than to include trucks

and heavy motor vehicles under Group 4 or, possibly, to group them separately. In general, the medical requirements for public-service vehicle (PSV) drivers are more strict than those for light vehicle drivers; the handicapped driver is a class on his own and much time and effort are spent in assessing each individual case with a view to enabling him to drive safely.

Examination of Drivers

The arrangement whereby every applicant is screened by a general practitioner, usually the family doctor, and all "abnormal" cases are investigated by the Chief Government Medical Officer has much to commend it. There are conditions which only the family physician with his intimate knowledge of the applicant's social and home background is in a position to indicate — epilepsy, alcohol or drug addiction, psychopathic tendencies. The link, however, between the general practitioner and the Chief Government Medical Officer is the Commissioner of Police and this raises the question of medical ethics. On the other hand, the Commissioner of Police cannot afford to relax his vigilance and, moreover, the applicant's consent to making known to the licensing authority the findings of the medical examination can be assumed.

Eyesight

Eyesight tests are required for all categories of drivers before a licence is granted, and if these tests indicate that the driver needs glasses for driving, this fact is recorded on his licence.

Visual Standards

Our visual standards are as follows:

- a) Visual acuity with or without glasses of 6/12 (Snellen) in one eye and any useful vision in the other for Groups 1, 2, 3 and 5.
- b) Visual acuity with or without glasses of 6/12 (Snellen) in the better eye and not less than 6/36 (Snellen) in the other eye for Group 4.

c) Monocular vision. — Visual acuity with or without glasses less than 6/12 (Snellen) is a barrier to driving. One-eyed applicants are not allowed to drive vehicles falling under Groups 2 (applicable to left one-eyed persons only), 3 and 4, but may drive vehicles under Groups 1 and 5 provided that:

- i. a certificate is produced every year from an ophthalmologist to the effect that the field of vision in the good eye is full and normal as assessed by a perimetry examination; and
- ii. in the case of left one-eyed applicants (blind right eye), a side mirror is fixed on the car in such a position as to overcome the restriction of the right lateral field of view and, thus, enable the driver to see an overtaking car in good time. (Motor driving in Malta is on the left side of the road).

In the case of left one-eyed (blind right eye) motor cycle applicants, the adaptation of a side mirror is not of any practical benefit as the front part of a two-wheeled vehicle is continually changing its position, thus disturbing the required angle of fixation of the mirror.

Our visual standards fall short of those recommended by the World Health Organisation, although they are equivalent to those obtaining in the United Kingdom. For example, in respect of PSV drivers, the total visual acuity recommended is at least 1.6 or 1.7 (decimal notation) as compared with our 0.67; in respect of light motor vehicle drivers, 0.8 (W.H.O.) against our 0.5.

Visual Fields

Under our present arrangements, only one-eyed applicants and cases presenting unusual features in visual acuity are referred to an ophthalmologist and then a

perimetry examination is required. A full perimetry examination for routine screening purposes is time-consuming and not really warranted in view of the low yield of positive findings. A fairly accurate measurement of the lateral vision can be obtained by means of the finger-confrontation test, made with each eye separately, and it has been suggested to the licensing authority that the Application Form should include the question: "Is the applicant's field of vision by hand test satisfactory?"

Hearing

Auditory Requirements

In testing for hearing of applicants for a motor vehicle driver's licence, the following considerations are taken into account:

- a) applicants who hear conversational voice (C.V.) at a distance of 15 feet or more are considered fit to drive any vehicle;
- b) applicants who hear C.V. at a distance of less than 15 feet are referred to the Chief Government Medical Officer for advice;
- c) applicants who hear C.V. at a distance of 15 feet with the help of a hearing aid are referred to the Chief Government Medical Officer for advice;
- d) applicants who suffer from more than a minor degree of deafness are not permitted to drive public-service vehicles.

These considerations, in particular (b) above, stem from the fact that rigid standards of hearing cannot be laid down and that factors other than hearing have to be reckoned in sub-standard cases, such as type of vehicle, competence of driver, nature of hearing defect. Hearing aids have been found to be of little benefit because of extraneous noises and difficulty in locating a sound (Norman, 1962). Studies have shown, moreover, that drivers with defective hearing have a slightly lower than average risk of accident involvement (McFarland, 1937).

Physical Disabilities

No effort is spared to enable an applicant with a physical disability to drive with safety: our golden rule is to concentrate on the residual function rather than on the disability itself. Thus, our assessment of physical disability is based on mechanical considerations, that is, whether the disability or deformity is likely to interfere with the efficient and rapid manoeuvring and handling of controls under all driving conditions, including emergency action.

In cases of doubt, an applicant with a physical disability is subjected to a special driving test by the Licensing Authority, at which a doctor from the Occupational Health Unit always attends. If applicant fails the test, we advise him on the type of specially adapted car (not necessarily an "invalid" car) best suited to meet his requirements — a form of motoring ergonomics. He is then given a Group 5 licence and the registration number of the specially adapted car is recorded on his driving licence. On the social plane, physically handicapped persons can obtain exemption from car licence fee and import duty.

Upper Limbs

Our primary consideration is that the driver should be able to control effectively the steering-wheel at all times: during gear-changing, sudden braking and even whilst operating the traffic indicator lever. Thus, the net function of both upper limbs as translated into one combined effort of gripping and manipulating the steering-wheel and gear-changing is assessed and actually tested in a trial drive. A basic condition is that the normal hand (in a unilateral disability) and the functional hand (in a bilateral disability) must be used to hold the steering-wheel. In certain circumstances, adaptations to the car are found to be necessary, especially in the manner of gear-changing; however, with the advent of full automatic transmission, even in small cars, our task has been made easier.

The wearing of a prosthesis is not ge-

nerally encouraged in view of the lack of facilities for rehabilitation.

Lower Limbs

The emphasis here is on the braking power of the right lower limb. But whatever the disability in the lower limbs, there is nowadays a safe and well-tried conversion to hand control available. When the disability is such as to be incompatible with the issue of a Group 1 licence, we recommend the following conversions:

- A. For disablement of both lower limbs
 - car is to be fitted with manual control of the accelerator, brake and clutch;
- B. For disablement of right lower limb only
 - car is to be fitted with manual control of the accelerator and brake;
- C. For disablement of left lower limb only
 - car is to be fitted with manual control of the accelerator and clutch: the driver can operate the foot brake and accelerator with his right foot, but needs hand accelerator control when moving off on a slope;
- D. For partial disablement of right lower limb
 - car is to be fitted with hand throttle control (with pre-set lever).

Marked Physical Disabilities

Persons with marked physical disabilities, such as amputation of a limb or more than 3 fingers, are not permitted to drive public-service vehicles. In the case of a taxi-cab driver, any physical disability must not hamper him from carrying out duties ancillary to his trade, e.g. prompt opening of doors and lifting and carrying luggage.

Cardiovascular Conditions

In view of the special arrangement with the Commissioner of Police, all applicants certified to be suffering from a

cardiovascular condition are invariably referred to the Chief Government Medical Officer for advice. An evaluation of each case is made by a Government Consultant Physician, including the taking of an electrocardiogram and a radiograph when indicated. Periodic medical observation can be made a condition in the driving permit.

Sudden collapse in the driver's seat and its consequences have been the subject of a number of reports (Peterson and Petty, 1962; Myeburg and Davis, 1964). Ischaemic heart disease provides the greatest risk, but the evidence to date indicates that the accidents following such collapse have been minor in degree, causing little damage to property and no serious injury to pedestrians, passengers or other drivers. It is the experience of many workers in the field of road accident prevention that persons so afflicted while driving usually have sufficient warning and presence of mind to slow down or stop before losing consciousness. Nonetheless the seventeen countries surveyed in 1968 by a Co-ordinated Medical Team (Council of Europe), of which the writer was a member, regard several cardiovascular conditions as being an absolute bar to driving any vehicle.

In Malta, cardiovascular diseases with increased liability to attacks of sudden loss of consciousness, faintness or sudden physical weakness (e.g. aortic vascular disease and persistent hypotension) preclude the sufferer from holding a driving licence. Such condition as aortic regurgitation constitutes an obvious danger and is a barrier to driving any vehicle. The difficulties in assessing arterial hypertension are well known; but it is generally agreed that applicants whose systolic pressure is persistently over 200 mm Hg, or a diastolic pressure persistently above 100 mm Hg, should not drive public-service vehicles (World Health Organisation, 1956). Organic heart disease, including valvular defects, coronary disease, angina pectoris or auricular fibrillation, equally disqualifies the sufferer from holding a licence under Group 4 — even a mild mitral stenosis which may progress to auricular fibrillation with its risk of embolism.

Diabetes

The group of diabetic subjects is obviously not homogenous, especially from the point of view of safety in driving. We try to define diabetic types according to the period of life when the disease begins and becomes manifest, i.e. the so-called growth-onset or adult-onset diabetes, and according to the need for, and response to, treatment, i.e. insulin-dependent diabetes. It is more than likely that the adult onset diabetic is already an experienced driver and is much less dependent on insulin.

It is universally accepted that no applicant under treatment with insulin is allowed to drive a public-service vehicle, even though the evidence incriminating hypoglycaemic attacks as a cause of road traffic accidents is scanty indeed (Norman, 1962).

Mental Disorder

In recent years, the Chief Government Medical Officer, in consultation with Government Psychiatrists, has evolved a procedure which is now normally followed in the case of applicants for driving stated to be suffering from a mental disorder.

- 1) Such an applicant, like all other prospective drivers, has to produce a medical certificate of fitness to drive, but in his particular case, the certificate must expressly state that applicant is "mentally fit to drive".
- 2) If the certificate is signed by a recognised psychiatrist, the licence may be issued, usually with qualifying reservations.
- 3) If the certificate is signed by a general medical practitioner, the relevant application is referred to the Chief Government Medical Officer who undertakes to sound, on an informal basis, the doctor's views on whether a second opinion by a psychiatrist is considered necessary. If such an opinion is not considered necessary, then the licence may be issued

on the strength of the general practitioner's certificate, usually with qualifying reservations. In practice, the psychiatrist is almost always consulted.

Psychosis

In most psychoses, lack of insight or judgement is a cardinal symptom and there is always the danger of a relapse. The qualifying reservations concern the applicant who undertakes:

- a) to follow the treatment prescribed by the psychiatrist (or general medical practitioner);
- b) to visit the psychiatrist (or general medical practitioner) at intervals to be specified by the respective doctor in charge of the case; and
- c) to authorise in writing the psychiatrist (or general medical practitioner) to report to the appropriate authority —
 - i. any deterioration in applicant's mental state which may affect his fitness to drive; and
 - ii. failure on applicant's part to keep a follow-up appointment.

Epilepsy

Epilepsy, both grand mal and petit mal, notwithstanding recent development in treatment, is an absolute bar to driving a public-service vehicle. Its danger lies not in the frequency of its occurrence but rather in its suddenness and unpredictability.

As a general policy, we stipulate certain conditions prior to granting a driving licence (other than Groups 3 and 4) to an epileptic, namely, *inter alia*, freedom from fits for 5 years or, preferably, normalisation of the EEG pattern owing to either drug therapy or spontaneity. In the United Kingdom, it is proposed to introduce legislation so as to enable driving licences to be granted to persons with epilepsy who are certified by a doctor to have been free

of any attack for at least three years, with or without treatment, or to have attacks during their sleep only. This concession would not apply to drivers of public-service vehicles, heavy goods vehicles or taxis.

Periodic Medical Examinations

There is no statutory provision for the periodic medical examination of any category of driver; but the periodic medical examination of certain selected cases, irrespective of the category to which they belong, can be made a condition of the licence at the time of application. The nature and extent of this examination may vary from a general medical re-assessment to a specific testing of eyesight, hearing, mental fitness, or muscular power.

The Chief Government Medical Officer, moreover, has recommended to the licensing authority that:

- a) PSV drivers should be examined at the ages of 50, 55, 60 and 65, and annually thereafter; and

- b) the licence of PSV drivers should be suspended if it comes to the notice of the Police that absences have occurred due to diseases of the heart, epilepsy, fainting, vertigo or any accident, until such time as a medical certificate stating that the driver concerned is fit enough to hold a Group 4 licence is produced to the Police.

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THE PARAMASTOID PROCESS

A survey of 890 Maltese skulls *

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Summary: A study has been made of the paramastoid process. Its aetiology, incidence, morphological characteristics, its functional significance in animals, and the clinical manifestations it can give rise to are described.

A survey of 890 Maltese skulls revealed the presence of paramastoid process in 18 of them — an incidence of 2.02%. 4 of the cases were of the articular type and there were 2 rare cases of atlanto-paramastoid synostosis — one unilateral, and the other bilateral and accompanied by synostosis of both atlanto-occipital joints.

The paramastoid process is a bony projection on the lateral part of the under-surface of the jugular process of the occipital bone. It is constant in the skull of certain animals but occurs only as an occasional anomaly in man.

The terminology used to describe the process is confusing. In the human skull it has been referred to as the paramastoid, paroccipital, paracondylar, parajugular or estiloid process. Corner (1896) calls it paroccipital, reserving the term paramastoid for the process on the inner lip of the digastric groove. The homologous process in animals is usually referred to as the jugular or estiloid process, though it has also been called paramastoid and paroccipital. The B.N.A. refers to it as the "processus paramastoideus", and it is this terminology which is here adhered to.

The paramastoid process was first described in the human skull by Meckel in 1815, and its articulation with the

transverse process of the atlas by Cruveilhier in 1851. Recently cases have been reported by Greig (1930), Mascitti and Strejilevich (1961) and others.

In the human skull the jugular process of the occipital bone often presents bony prominences of various shapes and sizes. According to Amadei (1880), only those which exceed 6 mm in height should be considered as paramastoid processes, though Chaine (1920) thinks that what determines a paramastoid process is not so much its size as its position and relations.

Most authors give the incidence of paramastoid process in the human skull as 0.5 to 1% (Table 1). Chaine (1920), however, includes all processes seen on the surface of the occipital jugular without consideration to size and so gives the high frequency of 52%. A survey was carried out of 890 Maltese skulls, including 29 Punic and 6 Neolithic ones. Adopting the criteria of Amadei (1880), we found a total of 18 skulls — a general incidence of 2.02%. Of these, 17 were found in modern skulls, one being present in the Punic group.

The paramastoid process is constantly present in certain animals where it has functional necessity. It is more fully developed in the herbivorous than in the carnivorous type. It is present in the dolphin, lizard, sloth, dog, cat (Fig. 1a), horse (Fig. 1b), pig (Fig. 1c), tiger, bear, camel and hippopotamus but not in the elephant. It is developed in some monkeys but not in gorillas, chimpanzees or in the orangutan though Corner (1896) thinks that in the orangutan it is present and occasionally very large. Smith (1909) states that it reaches its maximum size in some of the marsupials as in the kangaroo, but

* The survey was carried out by medical students C. Gauci and R. Farrugia Randon and by the writer.

Greig (1930) disagrees and thinks that, relative to the skull, it is much larger in the common pig. Mascitti and Strejilevich (1961) mention it as being abnormally long in the stag.

That the paramastoid process is more fully developed in herbivorous than in carnivorous animals suggests that its presence may be related to some peculiar movements of the mandible found in one and not in the other. Powerful muscles of mastication and deglutition often arise from it — the digastric and jugulo-hyoid muscles in the dog and the jugulo-mandibular in the horse, both muscles being depressors of the mandible. It seems that this process is supplementary to the jugular process of the occipital bone, providing a wider bony surface and more stable attachment to these muscles than the occipital jugular could alone afford. In this way it may be concerned with the side to side grinding movements of the mandible on the maxillae; it is in fact found in all those animals exhibiting such movements, except in the elephant. In man there is no extra muscular development to call into being a paramastoid process and its presence in the human does not therefore suggest an undue or abnormal use of the mandible.

There is no doubt as to the aetiology of the paramastoid process in the human skull. Le Double (1908) thinks it represents the inferior articular process of the occipital cranial vertebra, and Poirier and Charpy (1931) its transverse process. It is possible that the paramastoid process is a true congenital defect, being a manifestation of an occipital vertebra due to the scleromere of the third occipital sclerome not becoming incorporated in the cranium completely (McRae and Barnum, 1953). This congenital origin is however questionable for, though the process is hereditary in certain animals, it has not been proved to be so in man (Greig, 1930). Many attribute the process to pathological fixation in structures which extend between the jugular process of the occipital and the transverse process of the atlas, viz. part or all of the rectus capitis lateralis muscle (Amadei, 1880), the liga-

mentous apparatus (Macalister, 1894), or some fibrous band the homologue of the ligamenta transversaria (Greig, 1930).

The paramastoid process may be unilateral or bilateral; the former, the more frequent, may occur on one side or the other, while the bilateral type may be symmetrical or asymmetrical. In the present investigation there were 12 unilateral cases (7 right and 5 left) and 6 bilateral (1 symmetrical and 5 asymmetrical) (Table 2).

The shape of the paramastoid process is subject to considerable variation and accordingly several kinds are described (Corner, 1896, Chaine, 1920, Dehaut, 1948). Table 2 shows that the paramastoid process of the cases described in this investigation were conical (18), saw-like (4), and molar (1) in type.

The paramastoid process does not usually make contact with the atlantal transverse process. When contact is made, it is either by ankylosis or articulation.

Ankylosis occurs by cartilage or by bony fusion (synostosis). It is doubtful if this fusion should be interpreted as the synostosis of 2 originally separate elements or the failure to become independent *ab initio* of these elements. Cave (personal communication) thinks that they are originally independent and well-formed and only later does fusion take place, though old-standing pathological fusion of vertebral elements is almost impossible to distinguish from a congenital malformation.

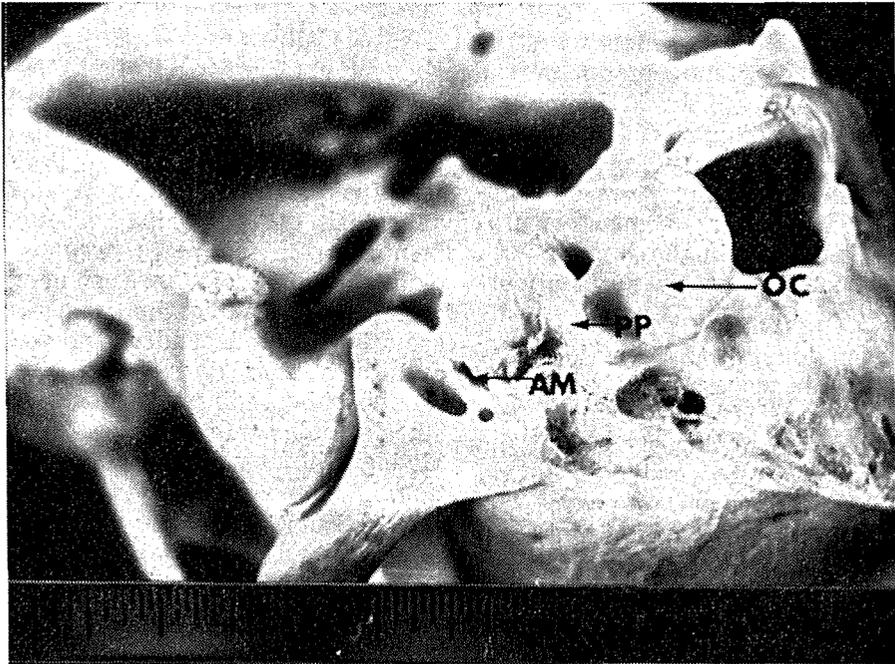
Articulation is by diarthrosis, the atlanto-paramastoid joint having a proper capsule and synovial sheath. Macalister (1894) described 3 ways in which contact between the paramastoid process and the transverse process of the atlas may take place, namely by a down-growing paramastoid process and a rising atlas spur, a paramastoid process descending to the atlas, or an upgrowth atlas coming into contact with a small paramastoid.

Cave (personal communication) thinks that ascending processes from the transverse process of the atlas towards the occipital are very uncommon. Le Double (1912) illustrates (p. 113, figure unnum-

TABLE 1
The Incidence of Paramastoid Process in the Human Skull

<i>Investigator</i>	<i>No. of cases of Paramastoid Process</i>	<i>No. of skulls Examined</i>	<i>%</i>	<i>Remarks</i>
1. Hyrtel	3	600	0.50	
2. Romiti	2	300	0.66	
3. Russel	(1961)	1160	0.70	N. American skulls - ancient & modern
4. Amadei (1880)	8	2197	0.36	
5. Le Double (1908)	3782	0.80		
6. Chaine (1920)	52.00			
7. Mascitti and Strejilevich (1961)	4	196	2.00	
8. Present Investigation (1968)	18	890	2.02	Maltese skulls - ancient & modern

FIGURE 1



a. Cat

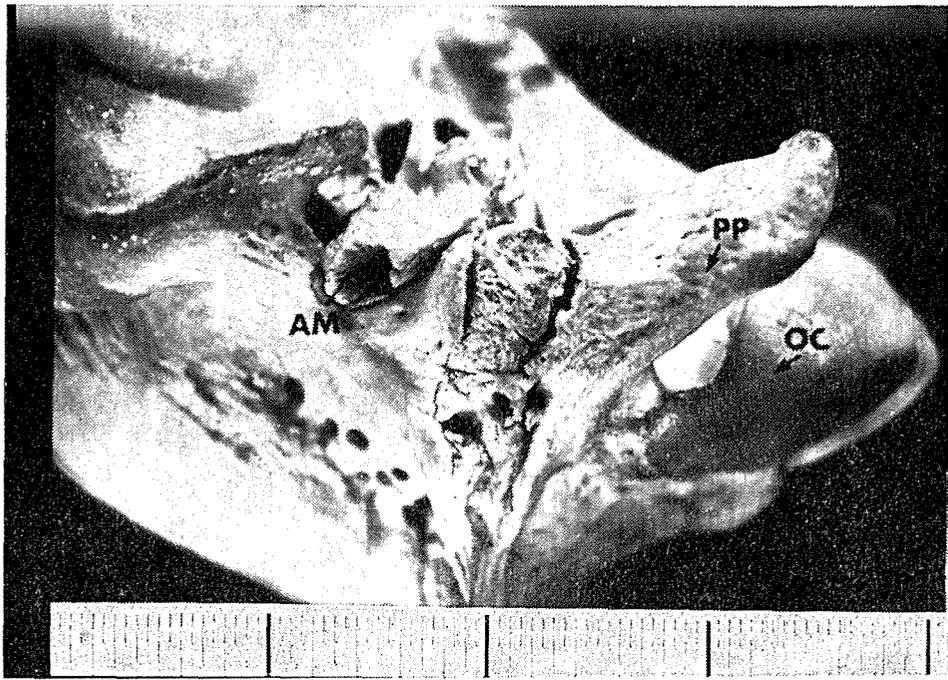
Lateral view of the skulls of the:

- a. Cat
- b. Horse
- c. Pig

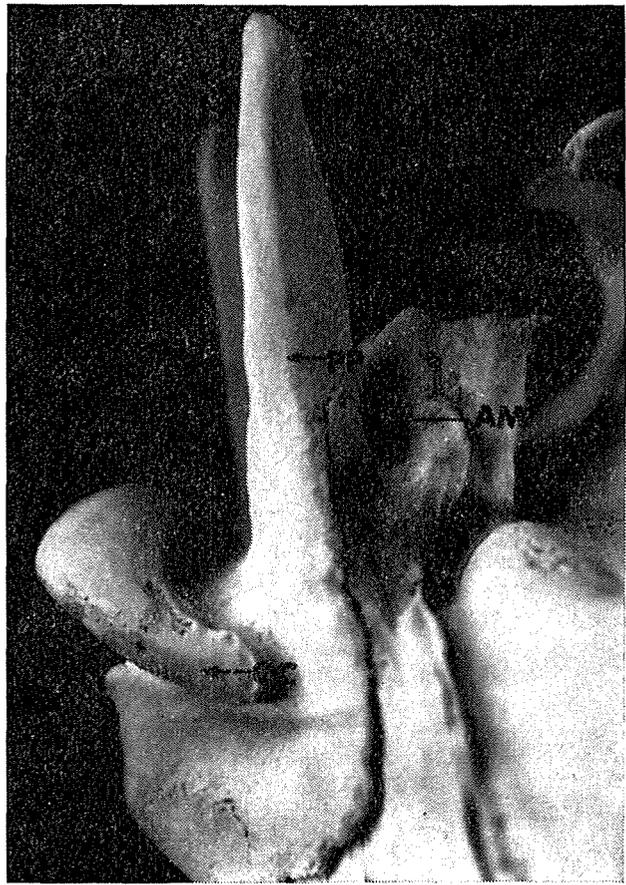
to show the difference in size of the paramastoid (jugular) process (PP) in animals of different dietary habits, and its large size in the pig.

OC indicates the occipital condyle and M the external auditory meatus.

Scale: inches.



b. Horse

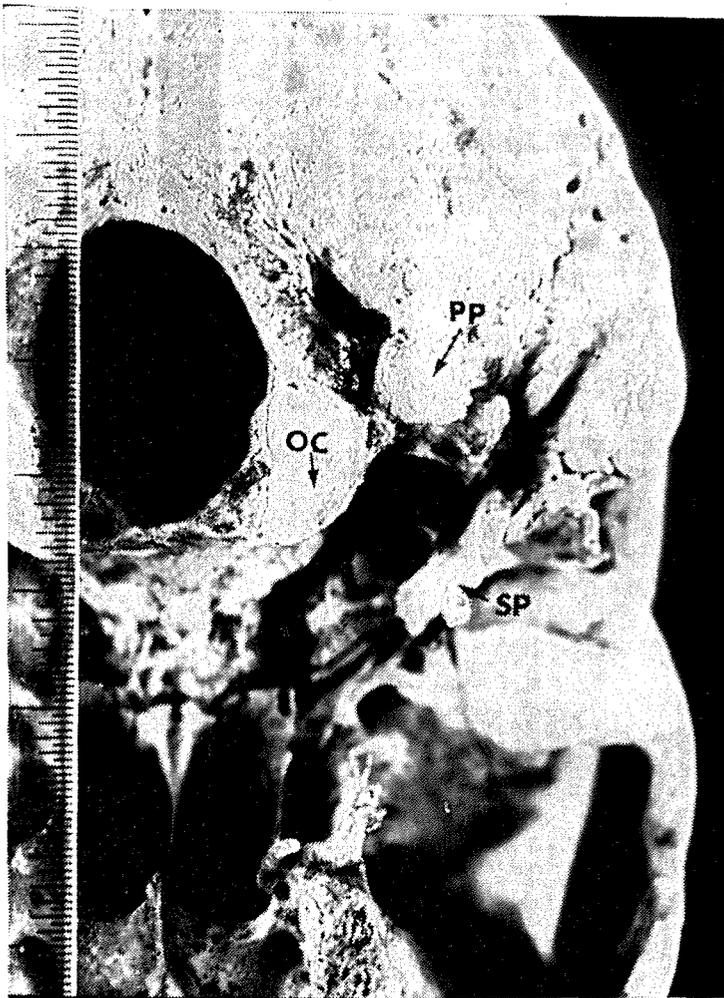


c. Pig

TABLE 2
Details of the paramastoid processes found in Maltese skulls.

Skull N.	Unilateral		Bilateral	Type (Chaine, 1920)	Height (mms)	Articular Surface
	Right	Left				
1			+	R saw-like L conical	9 7	—
2	+			conical	17	+
3		+		saw-like	15	—
4			+	R conical L conical	16 7	+ (marked)
5	+			conical	10	—
6			+	R conical L molar	8 8	
7		+		—	—	complete synostosis with transverse process of atlas.
8	+			conical	23	—
9	+			conical (with saw-like)	11	+
10	+			conical	7	—
11			+ (symmetrical)	R conical L conical	8 8	
12			+	R conical L conical	7 6	— —
13		+		conical	8	—
14			+	R conical	20	—
					—	<i>Right:</i> Fused with posterior aspect of atlantal transverse process but identifiable as a separate process. <i>Left.</i> Complete synostosis with atalantal transverse process.
15		+		conical	9	+
16	+			saw-like	13	—
17		+		conical	8	—
18 (Punic)	+			conical	8	—

FIGURE 2



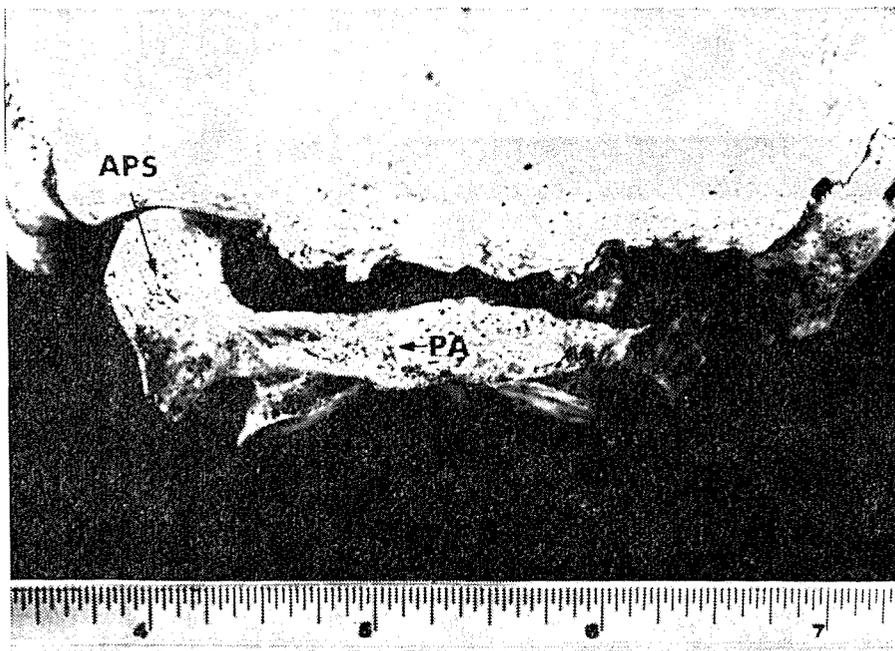
Base of human skull 4 (c.f. Table 2) to show the articular type of paramastoid process (PP) in surface view.

The articular surface on the paramastoid process faces laterally, posteriorly and downwards and articulates with the transverse process of the atlas.

OC indicates occipital condyle, SP the styloid process.

Scale: inches.

FIGURE 3



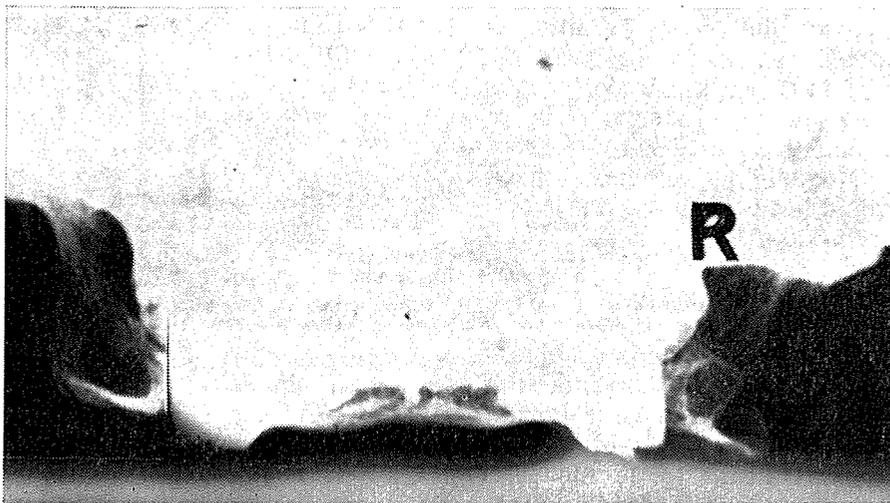
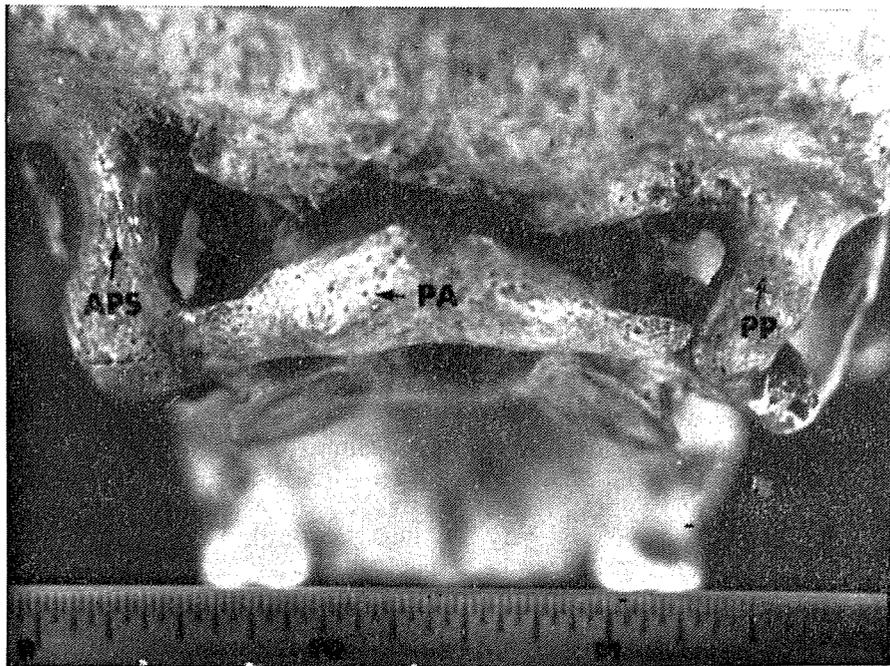
Human skull 7 (c.f. Table 2) to show complete unilateral atlanto-paramastoid synostosis (APS).

- a. posterior view
- b. X-Ray posterior view

PA indicates the posterior arch of the atlas.

Scale: inches.

FIGURE 4



Human skull 14 (c.f. Table 2) to show bilateral atlanto-paramastoid synostosis (this was accompanied by bilateral atlanto-occipital synostosis).

On the right the paramastoid process (PP) is fused with the transverse process of the atlas but identifiable as a separate process; on the left there is complete atlanto-paramastoid synostosis (APS).

Posterior view

- a. Posterior view
- b. X-Ray posterior view

Note the asymmetry and irregularity of the posterior margin of the foramen magnum. The inferior articular facets of the atlas appear normal.

PA indicates the posterior arch of the atlas.

Scale: inches.

bered) such a process (which is unilateral and of the articular type) and Cave came across one example several years ago (unpublished).

In the present investigation there were 4 paramastoid processes of the articular type (skulls 2, 4, 9 and 15 in *Table 2*); that of skull 4 is shown in *Figure 2*. There were also 3 processes of the ankylosed type (skulls 7 and 14 in *Table 2*). In skull 7 (*Fig. 3a*) there was complete synostosis of the paramastoid process with the transverse process of the atlas; its X-ray is shown in *Fig. 3b*. In skull 14 (*Fig. 4a*) the right paramastoid process was fused with the posterior aspect of the transverse process of the atlas, but was still identifiable as a separate process, while that on the left was completely synostosed to the transverse process; in addition there was complete synostosis of both atlanto-occipital joints; its X-ray is shown in *Fig. 4b*. Cave (personal communication) studied the skull and thought that both the occipital condyles and the left paramastoid process were probably primarily free and that their coalescence with the atlas supervened late in embryonic life; the fusions were certainly present since birth. Nodding — probably much limited — would have taken place at joints below the occipito-atlantal joint, though the atlanto-axial diarthrosis did not show any change. If the paramastoid process fused first with the atlas, the occipito-atlantal joint would be splinted and immobilised and fusion, superficially, of the condyles and atlas could have followed from ossification of the occipito-atlantal joint capsule; this seems to be the case here. Whatever happened in development, it seems that all parts were originally separate, that an adventitious paramastoid process contacted the atlas and merged with it, and that subsequently the occipito-atlantal joints were denied movement.

The presence of a paramastoid process may give rise to clinical manifestations,

including torticollis ossea with permanent lateroflexion and rotation and limited dorsiflexion at the atlanto-occipital joint (Kvasnicka, 1958); this may be associated with asymmetry of the face (Dwight, 1904).

Acknowledgements

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CLINICAL ASPECTS OF MEDIASTINAL EMPHYSEMA (PNEUMOMEDIASTINUM)

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Summary: The etiology of spontaneous mediastinal emphysema is varied. Two illustrative cases are described — one related to bronchial asthma, and the other to scuba diving. The characteristic clinical findings, including subcutaneous emphysema and the abnormal auscultatory signs are discussed. The differential diagnosis, including the close resemblance of mediastinal emphysema to a left medial pneumothorax is considered. The diagnostic importance of a left lateral chest X-ray taken in expiration is stressed. Management should be conservative unless clinical deterioration continues.

Etiology

The uncommon syndrome of mediastinal emphysema (pneumomediastinum) was recognised as long ago as 1819 when Laennec described it as interlobular emphysema stating that "when extravasation exists near the root of the lungs, it speedily extends to the mediastinum, and from there crosses to the neck and over the whole subcutaneous and intermuscular substance of the body". This highly characteristic clinical tendency to manifest itself by subcutaneous emphysema in the neck was found by Bodey (1961) to be present in 87% of the cases he analysed. Numerous causes are to be found in the literature and include such varied ones as influenzal pneumonia, (Clark and Synnot, 1919), smallpox, (Wilkinson, 1943), whooping cough, (Worden and Vardy, 1939), and measles, (Block and Vardy, 1968) among the infective causes. It can occur in the days old infant (Han, Rudolph and Teng, 1963) or may complicate labour

(Philips, 1938). One of the most common causes is bronchial asthma (McGovern *et al.*, 1961), and the condition is well recognized as occasionally complicating tracheotomy (Bergstrom and Diamant, 1960). Mediastinal emphysema may also be the presenting sign of tracheal neoplasia (Darch, 1962), and may rarely follow an infradiaphragmatic condition such as rupture of a gastric ulcer (Welty, 1949). An increasingly important cause of the syndrome is skin diving and scuba (self-contained under water breathing apparatus) diving.

The first case presented in this paper was related to scuba diving and illustrated the dangers of this sport while the second case was associated with bronchial asthma.

Case Reports

Case No. 1

An apparently healthy 32 year old American tourist had come to Malta for a short vacation and had gone scuba diving with hired apparatus. This had been his first experience of scuba diving. He had remained scuba diving for about an hour feeling perfectly well. After surfacing from one of his dives, he noted pain over the front of his chest and felt his face becoming bloated. He started having difficulty in keeping his eyelids open because of swelling of his eyelids. He landed on shore breathless, with one eye completely closed and the other half open. He was immediately rushed to hospital by bystanders.

On admission, he was mildly breathless with a pulse of 96 per minute and a B.P. of 120/70 mm. Hg. Crackling sub-

cutaneous emphysema could be elicited over his face and neck and over the chest wall. Auscultation of the heart revealed a characteristic crunching sound in systole. This sound was still present when he was asked to hold his breath. His right eye was completely closed because of the subcutaneous emphysema.

There was no relevant past medical history. In particular, he denied any recent or old respiratory illnesses. He was a moderate cigarette smoker.

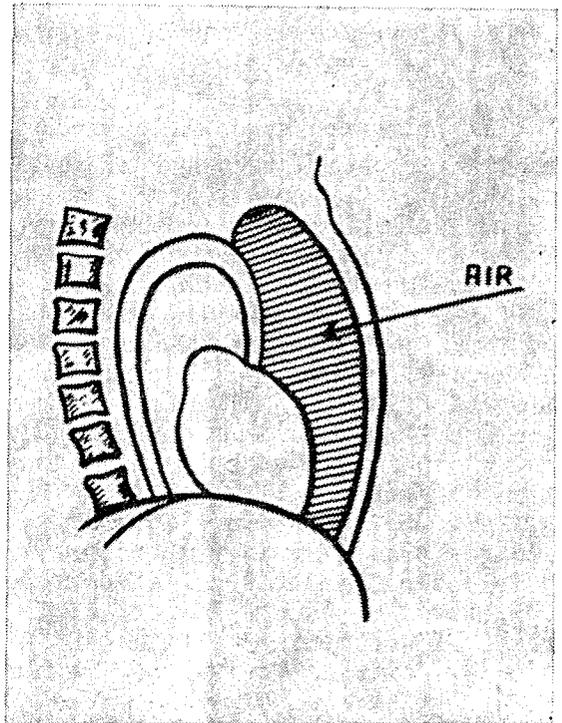
He was kept propped up in bed and was made to inhale oxygen (95%). His general condition quickly improved and within a few hours most of the subcutaneous emphysema had been absorbed. There was no trace of subcutaneous air after one week. He was then symptom free. Radiological studies made on admission showed the characteristic features of mediastinal emphysema.

The patient was discharged from hospital after ten days.

Case No. 2

A thirty year old Maltese male was admitted to hospital as an emergency on 1. 1. 68 because of the sudden worsening of his status asthmaticus. He had suffered from frequent attacks of asthma since he was a child, and was accustomed to using an inhaler spray with good effect to abort his asthmatic attacks. On the morning of admission an asthmatic attack had started. As he had run out of inhaler spray he was unable to abort the attack in the usual way as the nearby chemist's shop was closed because of the New Year holiday. A few hours after the onset of his symptoms he had noted sudden increase in the tight feeling across his chest and his breathlessness had increased. His relatives observed increasing cyanosis and swelling of the neck and face. His appearance became alarming and he was therefore taken to hospital.

On admission, his respiratory rate was 40 per minute, his B.P. was 140/90 mm. Hg. and his pulse was regular at 120 beats per minute. He was moderately cyanosed and on palpation of the swelling



Displacement of the heart posteriorly by air in anterior mediastinum.

of his neck, subcutaneous emphysema was diagnosed. There was a crunching sound on auscultation at the cardiac apex. He was orthopnoeic. There were no other abnormal features on examination apart from complete obliteration of cardiac dullness and the usual wheezing typical of asthma.

He was given oxygen to breathe, in as high a concentration as possible. He was started on Aminophylline intramuscular injections and Choledyl tablets 200 mgms. t.d.s. were prescribed. He was also sedated.

He felt better within the hour and on re-examination two hours later, the crunching sound had disappeared. On the fifth day there was no clinical evidence of subcutaneous emphysema.

Radiological studies taken within half an hour of admission were typical of mediastinal emphysema, the left lateral chest X-ray showing marked displacement of the cardiac outline posteriorly. *Fig. 1.*

The patient was discharged from hospital after a fortnight. A chest X-ray at the time of discharge showed no abnormality.

Discussion

These two cases illustrate two widely different etiologies of the syndrome. The second patient with bronchial asthma is typical of the commonest cause of mediastinal emphysema, though it usually occurs far more frequently in asthmatic children than in adults. Schwartz (1945) had collected 25 cases associated with bronchial asthma, from the literature. Severe air-trapping and bronchospasm cause rupture of the alveolar walls and air is allowed to dissect along the perivascular and peribronchial interstitial tissue into the mediastinum. Air enters the interstitial tissue during inspiration and is then slowly squeezed towards the mediastinum during expiration.

In both cases three classical signs associated with pneumomediastinum were elicited. The first and least important was

the obliteration of cardiac dullness by the air trapped in front of the mediastinum. This sign is not in any way pathognomonic, as it can be similarly produced by a pneumothorax.

The second sign, consisting of the "crunching" crepitations synchronous with the heart beats, is especially characteristic, though again not pathognomonic. It is believed to have been first described by Muller in 1888, but it was left to Hamman (1939) to re-emphasise its significance. He put spontaneous mediastinal emphysema on the medical map by analysing its incidence among the in-patient admissions over many years to the Johns Hopkins Hospital. The sign has become popularly known as Hamman's sign or crunch. It is worth stressing that this sign is not present in every case of pneumomediastinum. Bodey (1961), for instance found that it was only present in 53% of cases analysed by him. He had continued Hamman's study and calculated that the incidence of pneumomediastinum out of 654,612 admissions was about 1 in 40,000.

The crunch is usually best heard along the left sternal edge but not uncommonly it may be quite well heard at the apex, xiphoid area and occasionally over the entire chest wall. Very rarely the sound may be heard by an observer some distance away from the patient. The sound which may be heard in either systole or diastole is almost always accentuated in systole. It is amusing, on reviewing the literature associated with the description of the sound, to read of the various imaginative words or phrases used to describe it. Apart from its "crunching" quality, it has been thought of as "bubbling" or "tapping". It has been likened to "crackling of dry cellophane" or "the crunching sound of footsteps on dry packed snow on a brisk winter night" (Sulavik, 1962). Other descriptions used have included "click", "knock", "the sound of pebbles falling on taut canvas", "peas dropping on to the bottom of a pan", "leatherv", etc. (Cimmino, 1966). Patients' descriptions, keeping up with their medical masters, are likewise varied! The patient may feel as "if water and air are being

mixed together with each heart beat", or that there is a "wet sponge" in the chest (Sulavik, 1962).

The sounds may be transient and last only a few hours or else may persist for several weeks. The mechanism of production is probably due to the beating action of the heart on the numerous small air bubbles trapped between the heart and the anterior chest wall.

In their differential diagnosis, other conditions that must be considered include a left-sided medial pneumothorax (most important), bullous emphysema of the lingular segments, and dilatation of the oesophagus. An erroneous diagnosis of pericarditis may be made if the sounds are faint (Koshy, 1961).

The third clinical sign that is most helpful in the differential diagnosis is that of subcutaneous emphysema in the tissues of the neck, face or chest wall. It should be emphasised that the detection of subcutaneous emphysema without any apparent surgical cause should make the observer diagnose pneumomediastinum, as the air dissecting the fascial planes to cause supraclavicular, cervical or facial swelling must have originated there.

In both patients described in this paper early and adequate radiological studies were made. Anteroposterior and lateral chest X-ray were taken with a portable machine within the hour of admission. Surprisingly few patients reported in the literature have had a lateral chest X-ray taken. The view is the best one as it shows the amount of air in the mediastinum and the degree of shift posteriorly of the cardiac outline. The view should be taken in full expiration. In both patients, very definite evidence of posterior mediastinal shift was obtained. Repeat views days later showed disappearance of the shift with "reapposition" of the heart in the lateral view against the posterior wall of the sternum.

Review of the literature on mediastinal emphysema and analysis of the cases reported shows considerable diagnostic confusion between the condition and a left pneumothorax. Chapman in 1955

found a left pneumothorax in almost 50% of 47 cases studied. It was only too often that a diagnosis of mediastinal emphysema was made on insufficient evidence. Scott (1957) noted that an X-ray to show pneumomediastinum was carried out in only 41 out of 98 cases analysed. Hamman's crunch was however recorded in 90 of those patients. That the evidence on which these 41 cases are based is shaky is clear from the fact that at least 17 of these cases had a left pneumothorax.

Again during the last few years, emphasis has been placed on the lack of pathognomoncity of Hamman's crunch. Semple and Lancaster (1961) feel that the sign is far from pathognomonic and that it is more commonly present in a left pneumothorax than in mediastinal emphysema and that a left pneumothorax should be the foremost diagnosis to be considered whenever a "crunch" is heard.

Lastly, as far as differential diagnosis is concerned, the remote possibility of an underlying myocardial infarction should be borne in mind especially in the older age groups. It must not be forgotten that the commonest symptom complained of is chest pain, and that at least two instances have been recorded where mediastinal emphysema was precipitated by attacks of left ventricular failure following coronary thrombosis (Nash, 1957; Danish, 1954).

Several lines of treatment have been advocated by different authors. The first principle of treatment is management of the factor precipitating mediastinal emphysema — if a cause can be demonstrated. Thus in status asthmaticus vigorous treatment of the underlying bronchial asthma should be instituted. If the pneumomediastinum is the result of decompression sickness, then recompression in the more severe cases should be carried out.

The simplest and probably most efficacious line of treatment is the breathing of oxygen by mask — preferably 95% oxygen. Both patients here were treated with oxygen. Relief resulted within a short time. Breathing oxygen should be combined with rest and sedation.

Pneumomediastinum, when severe, is a potentially fatal condition. Progressively more heroic measures may be needed, depending on the degree of severity as judged by the cardiorespiratory embarrassment present. One of the simpler methods that may be tried is the needle aspiration of air. Some authors suggest cervical mediastinotomy, while as an extreme measure, tracheotomy has had to be carried out as lifesaving procedure. This seems prima facie paradoxical when one considers that one of the causes of mediastinal emphysema is tracheotomy (Bergstrom and Diamant, 1960). One must always remember the possibility of an associated pneumothorax, as the treatment that may have to be instituted is the introduction of an intercostal needle. In severe cases secondary to decompression illness, the treatment of choice is the use of a recompression chamber as was first carried out by Schulte (1957).

Whatever the cause of the mediastinal emphysema, the management should be conservative unless there are signs of imminent danger to life or evidence of deterioration in the general condition.

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THE CHURCH ON CAESAREAN SECTION IN MALTA IN 1867

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Ever since the Norman conquest of the Maltese Islands in 1090, the threads of church and state have been very closely woven into the pattern of our social life. This bond was strengthened by the advent to Malta and Gozo in 1530 of the monastic Order of St. John of Jerusalem.

The union between church and state was loosened for a brief while during the French occupation of these Islands (1798-1800) but with the passage of our Islands under British rule in 1800 there was a return to the old ecclesiastical influence; so much so that throughout the nineteenth century it became increasingly obvious that nobody spoke to the Maltese quite like the ecclesiastical authorities and that nobody wielded as much power as the church whenever major issues faced the nation.

Church influence was mainly felt in our ethical and political affairs but there was a short spell when it moved into medical territory giving rise to a controversy that caused quite a stir in Malta a century ago. The background to the story was the cholera epidemic that hit the Island in July 1867. What sparked off the argument were the surgical and religious implications of post-mortem Caesarean section.

On the 20th August a woman with a seven month old pregnancy died at the Mandraġġ of Valletta. The Police Physician of the city fell under a cloud because he declined to perform caesarean section as he adhered to a school of thought which

held that in cholera cases the foetus pre-deceased the mother (*Il Portafoglio Maltese* 1867 a and 1867 b). On the 1st October it was the turn of the Police Physician of Gudja to incur criticism. In fact he was warned by no less a personage than the Archbishop of Malta himself not to fail to perform caesarean section, should the occasion arise, on the corpses of pregnant women dying of cholera in order that the offspring might be given a chance to survive or, at any rate, to receive baptism (*The Malta Times* 1867 a). The Archbishop, Mgr. Gaetano Pace Forno, took such a serious view of these occurrences that on the 4th October he issued a circular on the subject addressed to the parish priests of his diocese (*L'Ordine* 1867 a). He reminded the clergy that it was their bound duty to enjoin medical practitioners to perform the caesarean operation whenever the occasion offered in order that no opportunity was lost of saving the offspring or at least ensuring that it received baptism. The Archbishop went on to state that where no physician was willing to perform the operation, the parish priests were bound by their sacred office to call in a midwife or other expert person for that purpose and, in the absence of such a person, to carry it out themselves (*The Malta Times* 1867 b).

The preoccupation of the church with the performance of caesarean section on dead pregnant women has a long history dating back to the Middle Ages when the church first counselled the carrying out of the operation immediately after the death of the mother. Some Catholic countries also enforced its performance by law. In 1608, for instance, the Senate of the Republic of Venice passed a decree en-

forcing doctors to perform the operation in every case of death in pregnant women near term. The same step was taken many years later — in 1749 — by the Kingdom of Sicily (*Prammatica sanzione*, 1749).

Some medical men also expressed themselves in its favour. In 1694 the French surgeon Philip Peu in his *Pratique des accouchements* advised its performance in the space of time taken to recite one *Ave Maria* (Radcliffe, W., 1967) and Joseph Lallemand, Bachelor of the Medical Faculty of Paris, recommended it in 1744 even on the living mother in cases of “difficult or desperate” birth (Lallemand, J., 1744).

With regard to Malta, Archbishop Pace Forno was by no means the first ecclesiastic to deal with the matter; in fact when he issued the circular of the 4th October 1867 he remarked that in inculcating the obligation to perform caesarean section he was only imitating the zeal of his predecessor Fra Vincenzo Labini who had published an edict on the same subject on the 14th June 1788 (*The Malta Times* 1867 b; *L'Ordine* 1867 b).

The Calabrian Fra Vincenzo Labini, who governed the Malta Diocese from 1780 to 1807, had found “chaos in all the branches of ecclesiastical administration” on being appointed to his See (Ryan, F. W. 1930). Among the “grave disorders to which some parish priests drew his attention was “the negligence of spouses” in ensuring the extraction of the foetus by the caesarean operation following the death of the pregnant mother. To eradicate this abuse the Archbishop published an edict exhorting the parish priests to observe the ordinations contained in the Roman Ritual on the subject. Parishioners were enjoined to inform the parish priest of the existence of pregnancy in women who were in danger of losing their lives. Those who failed to notify the parish priest of such pregnancies or who obstructed the performance of caesarean section incurred the pain of excommunication; on the other hand those who provided information or helped in any way to procure the operation were granted an indulgence of forty days.

He made it incumbent on the parish priest “to make the necessary preparations for the performance of caesarean section and thus endeavour, if possible, to save the temporal existence of the foetus or at least his spiritual life which is more important”. He quoted authors in support of the view that the foetus survived the mother for some time after her death and “even for a few days as shown by many instances of babies extracted alive from the mother’s womb after one or two days”. He referred to the case of Saint Raymund Nonnatus (1204-1240) who is alleged to have been born through a caesarean section three days after his mother’s death. He, therefore, recommended the carrying out of this operation without any loss of time as soon as there was certainty of the mother’s death under penalty of a grave sin. “And if”, he continued, “for any reason it cannot be done soon the mother’s abdomen must be kept warm by means of pieces of cloth heated on a fire and a hollow piece of cane placed in her mouth as prescribed by the Synods..... not because it is believed necessary for the respiration of the baby but to facilitate the entry inside the abdomen and then in the uterus of the dead mother of a purer and fresher air”.

The parish priests were to ensure the performance of caesarean section with “zealous firmness” but if persuasion failed they were to resort to “threats and even, if necessary, to recourse to the secular arm”. In cases where the family could not afford the expense, the parish priest himself was to pay the surgeon, the fee being afterwards refunded by the Archbishop.

Parish priests were to insist on the performance of caesarean section even in those instances where doctors or midwives declared the foetus to be dead “because there have been infinite examples of foetuses which did not move and were believed to be dead but which were actually found to be alive”; hence parish priests were instructed not to allow burials of dead pregnant women who had not undergone caesarean section. Immediately, therefore, on the death of a pregnant woman, the parish priests had to

secure the services of "a surgeon or, in his absence, a physician, a midwife, a barber or another person who wanted and knew how to carry out" the operation. In fact it was the parish priest's duty to see that there were "many" persons in his parish capable of performing it. The edict went even further; indeed the parish priest had to learn how to carry it out as in the absence of other persons capable of doing it he was obliged to perform it himself "under a grave sin..... to his personal spiritual and temporal peril". He was, therefore, to have at hand for that purpose "some iron or implement" with which to open the mother's body and extract the baby. Finally he was reminded to make certain of the number of foetuses in the womb.

We have no means of knowing how this edict, which was published in all the churches and had to be read again every year on the Sunday following the feast of the Holy Innocents, was received by the profession and by the people. In 1788 Malta was ruled by the autocratic government of the Order of St. John which allowed no public expression of opinion on such topics. Printed comment or criticism was just as inconceivable, as the only press in the Island belonged to the government and all literary material for publication had to be submitted for state and church censorship. The intellectual climate was quite different eighty years later when Archbishop Pace Forno issued his circular of 1867. The Maltese Islands had by then been under British rule for sixty-seven years and since 1839 had enjoyed the benefits of a free press. We are, therefore, in a position to learn the reactions prompted by the circular of 1867.

The crucial question that troubled men's minds was: How can a medically untrained man, such as the parish priest, know if a patient is really dead or not when it is at these times difficult even for a professional man to declare, until a certain interval of time has elapsed, that life is extinct? The danger of mistaking apparent for real death was a very burning issue as during the cholera epidemic of 1837 the rumour had gained ground that

persons believed to be dead were buried alive. At least two instances have been recorded. A girl thought to be dead from cholera left her coffin and was found crouching behind a door. The matron of the mental hospital had been pronounced to be dead and was placed in her coffin when movements were observed in her throat. She lived for over thirty years after this incident.

Doubts were also entertained as to the legality of opening a corpse immediately after death was supposed to have occurred. It was very aptly remarked that Maltese law prohibited burials within twentyfour hours from apparent death. A similar restriction on the time of inhumation had been imposed by the Diocesan Synod held in Malta in 1709 when it was decreed that corpses were not to be buried before the lapse of twelve hours to allow for the "exhalation of the spirit"; in the case of sudden death the interval was extended to twenty-four hours (Synodus Dioeciesana 1709). It was obvious, therefore, that if civil and ecclesiastical law prohibited burials within twelve to twentyfour hours after apparent death it followed as a corollary that it was also contrary to the law to open a body before the prescribed period of waiting had elapsed (*The Malta Times* 1867 b).

A further point was raised to the effect that to be successful, the operation had to be performed with all due observance of the rules of surgery. Did the parish priests possess the necessary knowledge of practical anatomy and the required surgical skill? And if they did not, what assurance was there that, if the mother was not really dead, her life was not sacrificed through lack of surgical proficiency? (*The Malta Times* 1867 c).

A section of the press turned against the medical profession. *L'Ordine* criticised an unnamed doctor who had expressed "the very false opinion" that in cases of cholera the foetus died before the mother and pressed the government to pass a law enforcing "doctors in all cases of pregnant women, without any exception, to carry out caesarean section to save the soul and body of a citizen who had the inherent

right to live" (*L'Ordine* 1867 b).

Il Portafoglio Maltese was even more declared this newspaper, "who are incapable in its attacks. "There are doctors", able of performing caesarean section and there are curates and midwives who carry it out successfully in accordance with the rules of surgical art. We do not want to mention the names of doctors who are not ashamed of confessing publicly that they have neither the courage nor the ability to perform caesarean section; nor the names of midwives who have shown in these months an extraordinary mastery in the extraction of the foetus". The doctors, continued the writer, were against the operation because "they are such cowards that they are not competent to do their duty" (*Il Portafoglio Maltese* 1867 c).

This outcry, as subsequent developments showed, was exaggerated and ill-expressed besides being extremely hard on a body of professional men who were far from being the callous and inefficient persons depicted by this newspaper. In fact as early as 1802 the Regulations of the Civil Hospitals of Valletta made it obligatory upon the principal surgeon of the hospital to perform caesarean section when the case required it. That this ruling referred to pregnant women dying before childbirth is evident from the fact that the first caesarean section to be carried out on a living woman did not take place until 1891 in Malta (*Piano per il regolamento dell'ospedale di Malta*, 1802. Cassar, P. 1965).

An instance of a post-mortem caesarean section was recorded during the plague of 1813 when a Senior Health Guard at the Lazzaretto "opened the body of a dead pregnant woman, under the direction of the physician, to enable the infant to be baptized" (Burrell, W. H. 1855). During the cholera epidemic of 1837 Dr. G. M. Stilon "never neglected" to perform caesarean section on dead pregnant women (Stilon, G. M. 1839) and Dr. T. Chetcuti records the extraction by caesarean section of three living fetuses "who were immediately baptized by the chaplain" (Chetcuti, T. 1838)..

Maltese medical men, therefore, had

a long tradition and experience to draw upon by 1867. That there were, in fact, doctors who rose to the occasion and who were willing and capable to perform the operation in 1867 is borne out by news items reported in the contemporary press.

On the 6th October, that is two days after the issue of the Archbishop's circular, caesarean section was performed on a woman who had succumbed to cholera while in the 4th month of pregnancy; "the foetus outlived the mother for seven minutes and received baptism". The operation was carried out by the "clever and skilful" Dr. S. L. Pisani (*Il Portafoglio Maltese* 1867 b; *The Maltese Observer* 1867; *L'Ordine* 1867 c). By the 11th October another two caesarean sections were performed on pregnant women dying of the disease with the extraction of live babies (*L'Ordine* 1867 b). On the 22nd October another operation was reported on a choleraic patient believed to have been in the fifth month of pregnancy — but no foetus was found to exist (*The Malta Times* 1867 c).

No specific instances of caesarean operations carried out by midwives and parish priests or other lay persons have been recorded so that presumably none of the medical men who came across cases requiring the operation neglected doing it following the publication of the Archbishop's circular.

Cholera began to decline by the end of October after attacking 403 civilians of whom more than half lost their lives. On the 17th November a *Te Deum* was sung in all the churches by order of the Archbishop in thanksgiving for the liberation from cholera (*L'Ordine* 1867 d) and the controversy faded into obscurity.

This forgotten episode in Maltese medical history may not, at first sight, appear to be so remarkable as to justify its bringing into focus again after one hundred years. A little reflection, however, not so much on the bare events themselves as on the basic principles that underline them will show that their implications bring it into the ken of the medical practitioner of to-day. Indeed among the issues that have been triggered off in our time by the recent heart transplants are precisely (1) the

sure establishment of the diagnosis of death, and (2) the determination of the moment of irreversibility of the changes producing death — exactly the same questions that tormented the minds of our predecessors a century ago.

These themes have now been studied by no less a body than the World Medical Assembly during its session of the 9th August 1968 in Australia; but although much useful guidance as to the signs of death is contained in the Declaration of Sydney we have still to admit that "it is impossible to say precisely when human life becomes extinct" (British Medical Journal, 1968).

Apart from this diagnostic problem, the events of 1867 are also significant for the present generation of medical men in so far as they remind us that (1) technical achievement in medicine and surgery sometimes create problems in the ethical field; and (2) the physician and surgeon in treating the sick is actually dealing with the whole human personality which cannot be isolated from the psychological, cultural, social, moral and religious matrix in which it is rooted without provoking the hostility and censure of the social milieu in which he exercises his profession.

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ANAEMIA IN PREGNANCY

— THE MAJOR CAUSES IN MALTA

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There is an appreciable incidence of anaemia in pregnancy in Malta. In a recent survey, it was found that 33% of untreated patients first attending the antenatal clinic had a haemoglobin concentration of less than 12 g. per 100 ml. and just over 10% had a haemoglobin concentration of less than 11 g. per 100 ml. (Benster, 1968).

The full investigation of all anaemic patients in pregnancy is an enormous task, but as accurate diagnosis is essential for correct treatment, it is of value to find the incidence of the major causes.

The importance of several investigations in the diagnosis of anaemia was first assessed by comparing the results in anaemic patients and non-anaemic controls in the third trimester of pregnancy. For the purpose of this survey, patients with a haemoglobin concentration less than 11 g. per 100 ml. were considered anaemic and patients with a haemoglobin concentration above 12 g. per 100 ml. were used as controls.

After considering the diagnostic criteria, the incidence of the major causes will be assessed.

Methods

Haemoglobin was estimated as cyanmethaemoglobin (Dacie and Lewis, 1963). Blood smears were examined under oil immersion after Leishman staining.

Serum iron (SI) and total iron binding

capacity (TIBC) were measured by the dipyrindyl method (Ramsay, 1957).

Haemoglobin A₂ estimation was carried out using the method of quantitative paper electrophoresis (Black, Miller, and Wan, 1966). Qualitative paper electrophoresis was performed according to the method of Lehmann (1968).

Haemoglobin F was estimated by the Betke modification of the alkali denaturation of cyanmethaemoglobin as described by Lehmann and Huntsman (1966).

The serum proteins were measured by the biuret method (King and Wootton, 1956). Serum bilirubin estimations were carried out by means of diazotized sulphanic acid as described by King and Wootton (1956).

The presence of occult blood was detected by employing the ortho-tolidine reaction (Kohn and O'Kelly, 1955).

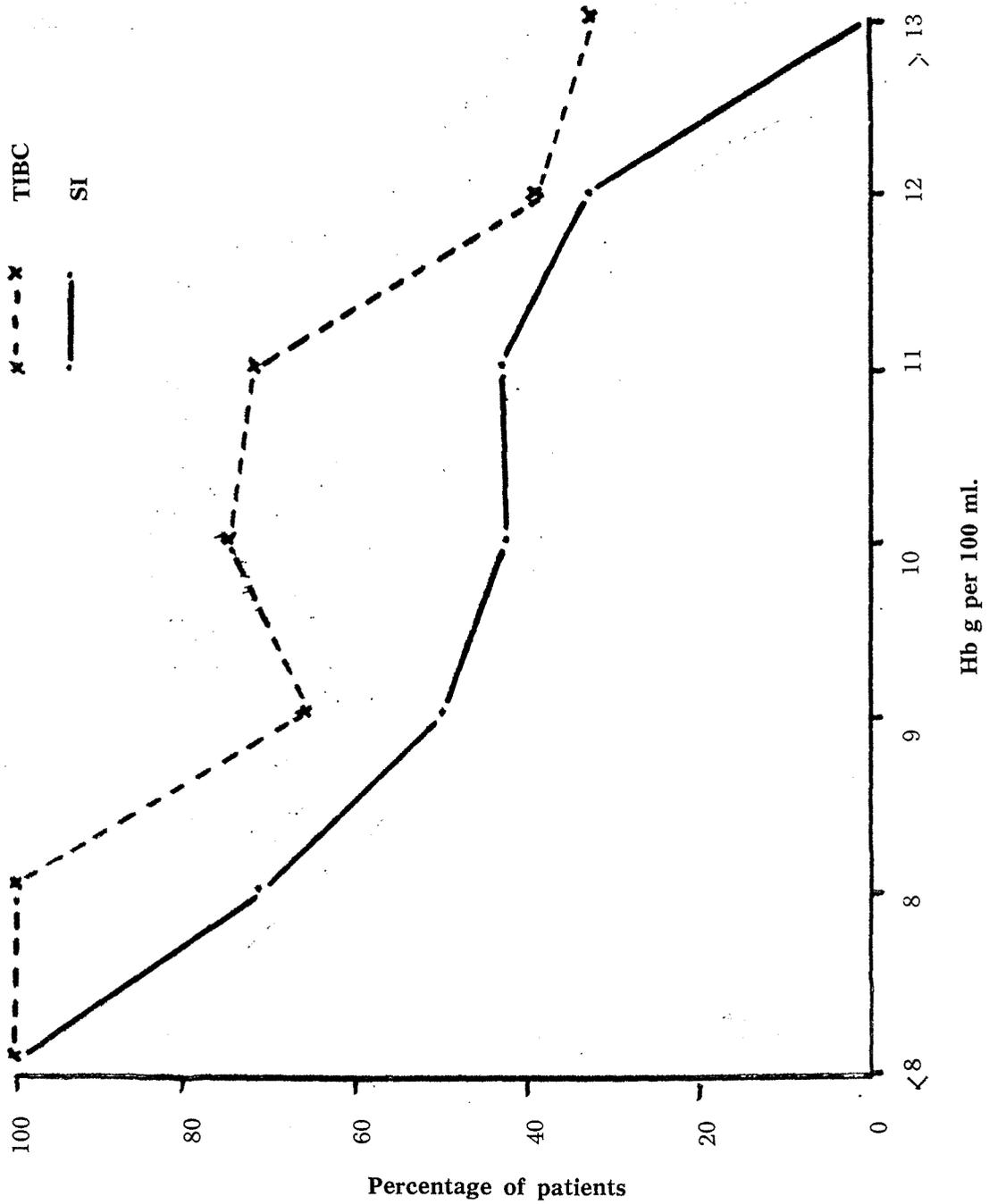
Stools were investigated for the presence of ova and cysts by the formal-saline concentration method.

Midstream specimens of urine were screened for significant bacteriuria (Leigh and Williams, 1954) and when > 100,000 organisms per ml. were detected the nature and sensitivity of the growth was investigated by culture.

Serum Iron and Total Iron Binding Capacity

In females the normal values for serum iron are 60–160 μg per 100 ml. and

Fig. 1



Percentage of patients with abnormal S.I. and T.I.B.C. according to haemoglobin concentration.

TABLE I
Correlation of haemoglobin concentration with serum iron and total iron binding capacity

Hb concentration (g. per 100 ml. blood)	<8	8-	9-	10-	11-	12-	13+
		8.9	9.9	10.9	11.9	12.9	
Mean SI \pm SD (μ g per 100 ml.)	19.4 \pm 9.4	43.6 \pm 24	68.6 \pm 5.7	69.2 \pm 33	75.6 \pm 48	72.5 \pm 21	90.5 \pm 18
No. patients	4	7	26	49	23	15	4
Percentage of Patients with reduced SI	100	71.5	50	42.8	43.5	33.3	0
Mean TIBC \pm SD (μ g per 100 ml.)	541 \pm 43	498 \pm 39	439 \pm 24	448 \pm 15	467 \pm 23	383 \pm 21	363 \pm 53
No. of patients	4	6	24	47	22	15	3
Percentage of patients with raised TIBC	100	100	66	75	72	39	33

TABLE II
The serum iron and total iron binding capacity in patients with raised haemoglobin A²

Patient	Hb concentration (g per 100ml.)	Hb A ² (per cent)	SI (μ g per 100ml)	TIBC (μ g per 100ml)
A.A.	9.3	5.9	100	250
T.R.	10.0	4.0	124	345
M.A.	9.9	4.4	60	582
B.R.	10.7	4.5	80	360
C.J.	11.0	4.7	112	243
N.Z.	10.8	4.4	25	450
C.R.	10.2	+	129	495

+ elevated qualitative electrophoresis.

for total iron binding capacity 200–400 μ g per 100 ml. In the present study the percentage of patients with reduced SI and elevated TIBC was found to increase with reduction in haemoglobin concentration as may be seen from *Table I* and *figure 1*. It is also seen that the frequency of abnormal TIBC is greater than the frequency of abnormal SI. The SI is normal in all patients whose haemoglobin concentration is above 13 g. per 100 ml. but the TIBC remains moderately elevated in 33%. In this series the serum iron seems to be of more value than TIBC in the diagnosis of anaemia in pregnancy.

mia in pregnancy.

Haemoglobin A²

The haemoglobin A² level was considered elevated if above 3.7%. The value of the haemoglobin A² level in the diagnosis of thalassaemic anaemia has been discussed in a previous paper (Benster and Cauchi, 1969).

In seven patients with elevated haemoglobin A² levels the serum iron was reduced in one and the total iron binding capacity was slightly elevated in three as may be seen from *Table II*.

TABLE III
Serum proteins and bilirubin
in normal pregnancy and anaemia in pregnancy
(Number of patients in brackets)

	<i>Normal Pregnancy Mean \pm SD</i>	<i>Anaemia in Pregnancy Mean \pm SD</i>	<i>"t"</i>	
Total Protein (g. per 100 ml.)	7.1 \pm 0.6 (12)	6.4 \pm 1.0 (53)	2.26	P < 0.05
Albumin (g. per 100 ml.)	3.6 \pm 0.4 (12)	3.3 \pm 0.5 (52)	2.27	P < 0.05
Bilirubin (mg. per 100 ml.)	0.9 \pm 0.4 (12)	0.8 \pm 0.3 (49)	1.01	P > 0.1

Haemoglobin F

A raised haemoglobin F was detected in only 4 out of 129 patients. In two of these the haemoglobin A² was also elevated. In pregnancy a slightly elevated haemoglobin F might be the result of foetal cells circulating in the maternal blood. Haemoglobin F does not seem to be as valuable as haemoglobin A² estimation in the diagnosis of the type of thalassaemia found in Malta.

Serum Proteins

The significant reduction in total protein and albumin associated with anaemia may be an expression of nutritional deficiency, though it could also be due to the excessive plasma volume increase that sometimes occurs in pregnancy. It would require nutritional and blood volume studies to assess the importance of these factors.

Serum Bilirubin

The mean level of serum bilirubin in the anaemic patients, 0.8 \pm 0.3 mg. per 100 ml., is not appreciably different from the mean level 0.9 \pm 0.4 mg. per 100 ml. in the non-anaemic controls. The serum bilirubin has not been of any diagnostic value in the investigation of the present series of anaemic patients.

Significant Bacteriuria

Anaemic patients had an appreciably greater incidence of significant bacteriuria than the non-anaemic controls as may be seen from Table IV.

TABLE IV
**Effect of anaemia on the incidence
of significant bacteriuria**

	<i>Anaemic</i>	<i>Controls</i>
No. investigated	76	20
No. with significant bacteriuria	9	1
Per cent incidence	11%	5%

Positive Occult Blood

It was found that the occult blood test was more frequently positive in the non-anaemic controls than in the anaemic patients as may be seen from Table V. This surprising result may be explained by the subsequent finding that the test was more frequently positive in patients who had recently taken iron tablets or meat in the diet, and it was found that the anaemic patients had a lower meat intake than the non-anaemic controls.

TABLE V
**Effect of anaemia on the incidence
of positive occult blood**

	<i>Anaemic</i>	<i>Controls</i>
No. investigated	66	20
No. with positive occult blood	20	10
Per cent incidence	30%	50%

Intestinal Parasites

Ova and cysts were detected in the stools in six anaemic patients; *Giardia* in three, *Trichuris* in two, and *Enterobius* in one. All six patients had negative occult blood. The most important parasite to have been incriminated as a cause of anaemia in pregnancy in areas where it is prevalent, is *Ankylostoma duodenale* (Hookworm). This was not found in any of the stools examined.

* * *

The incidence of the major causes of anaemia in pregnancy has been assessed using the following criteria:

1. Iron deficiency

All patients with a serum iron less than 60 μg per 100 ml., and showing hypochromia and anisocytosis in the blood film were considered as iron deficient. This was confirmed if there was a progressive improvement in the haemoglobin concentration and in the blood film particularly with the presence of polychromatic erythrocytes after iron therapy.

2. β Thalassaemia trait

The diagnosis of β thalassaemia trait was made in those cases where the haemoglobin A_2 level was raised above 3.7% and the blood film showed significant morphological abnormalities of the erythrocytes.

3. Urinary tract infection

The diagnosis of anaemia due to urinary tract infection was only made when there was no other apparent cause. All patients had normocytic normochromic erythrocytes and the serum iron was normal.

4. Hypervolaemia

Many authors have suggested that excessive plasma volume increase in pregnancy may reduce the haemoglobin concentration (Low, Johnson and McBride, 1965, Paintin, Thomson and Hytten, 1966). This diagnosis was considered only in patients with a normal blood smear and a

persistent mild reduction in haemoglobin concentration that returned to normal levels soon after delivery.

5. Folic Acid deficiency

This was suspected when an increased incidence of hypersegmented neutrophils was seen in the blood smear (Chanarin, Rothman and Berry, 1965) in patients whose anaemia did not respond to iron, but showed a good response when folic acid was given in addition.

An accurate assessment of folic acid and vitamin B_{12} deficiency is important for the diagnosis of anaemia in pregnancy, and it would be of value if in any future survey, estimation of serum folate and serum B_{12} levels were undertaken.

In 76 patients whose haemoglobin in the third trimester of pregnancy was less than 11g. per 100 ml., the incidence of the major causes of anaemia using the above criteria was as follows:

Iron deficiency	56.6%
Possible Folic acid deficiency	10.5%
Hypervolaemia	10.5%
β Thalassaemia trait	7.9%
Urinary tract infection	5.3%
Diagnosis uncertain	9.2%

It is well established that dietary iron is barely sufficient to meet the requirements of pregnancy, and deficiency is likely to occur if there is any additional predisposing factor. The incidence of several predisposing factors to iron deficiency was compared in the anaemic patients and non-anaemic controls. In the anaemic patients there was an appreciably greater incidence of menorrhagia before pregnancy, gastro-intestinal disturbances, haemorrhoids and bleeding gums. It was also found that the intake of meat was less frequent in anaemic patients than in the non-anaemic controls. It has already been shown that patients of very high parity have a higher incidence of anaemia (Bensteer, 1968) and this is especially true if pregnancies have rapidly succeeded one another.

Conclusions

Iron deficiency is the most important cause of anaemia in pregnancy.

There is an appreciable incidence of β thalassaemia trait, urinary tract infection and possibly folic acid deficiency.

Serum iron, haemoglobin A₂, and urine culture are important for the investigation of the cause of anaemia in pregnancy in Malta.

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We should like to thank Professor A. P. Camilleri and Dr. E. A. Agius for permission to study patients under their care.

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INTUBATION WITH POLYVINYL CHLORIDE TUBES IN YOUNG CHILDREN

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A girl of 2½ years was admitted to Victoria General Hospital, Gozo, at 5.15 a.m. on Wednesday the 22nd January. The family doctor had first seen the child the previous evening at 10.00 p.m. and given her Penicillin and Streptomycin. On admission the child was suffering from laryngotracheitis. Treatment was started with: Penicillin and Streptomycin; steam kettle; blocks at head of bed; Prednisolone.

At 9.00 a.m. the child went into acute severe respiratory obstruction, and quickly become deeply cyanosed and lost consciousness. The pupils became dilated and there was marked indrawing of the suprasternal notch and intercostal spaces and much recession of the lower ribs. Oxygen was administered and the child become semi-conscious, regained a good pink colour but was struggling continuously and

started having repeated bouts of laryngeal obstruction with deep cyanosis. Restoration of the airway was imperative and it was decided to intubate. The child was quieted down with Fluothane using a Schimmelbusch mask, oxygen being administered throughout. A polyvinyl chloride tube, size 00, was passed nasally and was guided through the glottis with ease; the whole procedure (i.e. anaesthesia, intubation) taking less than 90 seconds.

The child quickly regained consciousness, did not become restless and soon went into a restful sleep with good normal pulse, pink colour and showing no sign of respiratory distress except for a slight increase in rate. An injection of Dexamethasone was given.

At 12.00 noon, she managed to wriggle out of the arm restraints and pulled

the tube out. No more serious respiratory emergencies occurred. It was decided to treat conservatively. She maintained a steady improvement and was discharged from hospital on 31. 1. 69. The child has been normal since then.

The case is presented because intubation was meant: i) as a life saving effort, which it was; ii) to be, if so required, a prolonged endotracheal intubation as described by T. H. Allen and I. M. Steven (1965) of Adelaide Children's Hospital. This technique has proved remarkably effective and complication-free, provided care and proper equipment are used.

Prolonged endotracheal intubation is rendered possible by the special non-irritating physical properties of polyvynil chloride: i) malleability; ii) plasticity at body temperature; iii) remarkable biological inertness.

Results of prolonged endotracheal intubation in small children (under 5 years of age) have been consistently good. In a personal communication Dr. Allen, the Director of Anaesthesia at Adelaide Children's Hospital, informs me that "several other medical centres are now successfully applying this technique as an alternative to tracheotomy."

It is no surprise, then, that the editorial comment in the Year Book of Anaesthesia 1966/67 should think it "remarkable how courage and experience can establish the validity of a sensible but often discarded approach to a solution of

a problem" and that the Editor's "bias and experience favour endotracheal intubation".

Prolonged pernasal intubation abolishes many of the complications of tracheotomy such as:

- i) Dislodgement of the tube
- ii) Surgical emphysema of the neck and mediastinum
- iii) Pneumothorax
- iv) Decannulation problems
- v) Many nursing problems.

Besides, intubation in an emergency will not only save the patient but provide optimal conditions for an elective tracheotomy (if this is decided upon) — much more practical and safe than emergency tracheotomy in the first instance.

The tube used on this child was one of a set given to me by the Chief Consultant Anaesthetist of Glostrup Amts Sygehus in Copenhagen where I first had experience of this technique.

Acknowledgements

My thanks are due to Dr. W. Grima (Supt. Vict. Hosp.) for permission to publish the case and to Dr. C. Grima for his help during the emergency.

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AN INVESTIGATION OF THE THERMAL AND ENVIRONMENTAL CONDITIONS IN THE HOLDS OF SHIPS CARRYING CEMENT

An occupational health survey

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Summary: Following a fatal case of heat stroke, the Occupational Health Unit undertook the investigation of the thermal and environmental conditions in the holds of ships arriving in Malta to unload hot cement. Fifteen ships were surveyed over a period of three months.

The state of dustiness in the holds was not judged to be prejudicial to the health of stevedores working therein, whereas the thermal environment on several occasions, particularly in the month of October, was deemed to impose such a physiological strain on them that it warranted the reduction of their hours of exposure. Of the four heat stress indices chosen, the corrective effective temperature and the predicted four-hour sweat rate emerged as the most suitable indicators of the composite stress. The P4SR correlated best with the severity of the thermal hold conditions obtaining at any particular phase of the investigation. The thermal limits were set at a CET of 75°F. and a P4SR of 3.

This survey helped to effect changes in the legislation regulating the working arrangements of stevedores.

In the afternoon of July 28, 1965, a stevedore who was unloading cement sacks from the hold of a ship berthed at Marsa died suddenly on the job. His death was attributed by the Court medical experts (one of whom was the writer A.G.) as due to heat stroke. This unfortunate incident caused great uneasiness amongst the ste-

vedores and heralded a period of industrial unrest which culminated in a national port strike (October 9-12, 1967). The present investigation was carried out against this background and was requested by the Minister of Labour, Employment and Welfare and the Port Labour Joint Council. Its purpose was two-fold:

- (1) to investigate the thermal and environmental conditions prevailing in the holds of ships off-loading cement; and
- (2) on the basis of these findings, to determine whether the stevedores' claim for an extension of the summer manning scale into the winter months was justified on occupational health grounds.

In view of the urgency of the situation, we were required to submit our report by the first week of January, 1968; that is, the period of investigation, and therefore our conclusions, had to be restricted to the months of October, November and December, 1967.

Up to the time of the survey, gangs engaged in the unloading of cement were normally made up of seven men all of whom worked inside the hold. This was the "winter manning scale". In the warmer months of the year, the seven men in the hold were increased to twelve who worked in groups of six in alternate shifts of one-hourly spells. This was the "summer manning scale" and in effect it halved the daily working load of the stevedores inside the hold. The winter scale was in operation

between October and June, both months inclusive, but if at any time during this period the surface temperature of the cement sacks ("sack temperature") exceeded 110°F., the summer manning scale was introduced — Port Labour (Determinations) Order, 1966. The stevedores' claim therefore, meant the adoption of the 12-men shift scale throughout the year, irrespective of the sack temperature.

From October 1967 up to the 4th January, 1968, fifteen ships carrying cement were investigated, an outside average of five ships per month. As the period under investigation, short as it was, could have been a lean one for cement ships and thus unrepresentative of the actual movements during a whole year, we correlated this finding with the information submitted by the Port Manager of ships arriving in Malta in 1966 and 1967. We found that the rate of ten ships per month was a more correct statistical average. Again, we ascertained that a ship normally took 1.7 days to unload its cargo and that the official hours of work in the port were from 0700 to 1200 hours and from 1300 to 1700 hours, namely, an exposure of nine hours per working day. Conceivably, therefore, any one stevedore could be exposed to the environment under study for a maximum of 1801 hours per annum. This figure is unrealistic and is biased in favour of the worker because:

- (a) it assumes that every stevedore has been working on every ship arriving in Malta whereas we know that different gangs of men are involved in cargo handling operations;
- (b) two or more ships may be concurrently unloading their cement on the same day.

But in an investigation of this kind, it is only natural that the worst possible conditions are underlined and, for the purpose of this survey, the measure of exposure of stevedores in the hold was set at 1801 hours per annum.

From our past experience and knowledge of the work-situation in the holds of ships carrying cement, we had decided early on in our investigation that the most

pertinent fields of study which could sway our conclusions either way related to:

- (A) the state of dustiness in the hold; and
- (B) the thermal environment in the hold.

Throughout the survey, we never had any reason to regret this approach and, in retrospect, we feel certain that no other occupational factor is of greater, or equal, significance.

Cement dust in the hold

Exposure to cement dust is not an occupation reckoned to lead to lung injury (Hunter, 1964). Intensive studies have been carried out by Gardner *et al.* (1939) who examined clinically and radiologically 2,278 cement workers; notwithstanding the high concentration of dust in certain sections of the industry surveyed, no case of disability was met with and radiographic abnormalities were of the slightest. In a follow-up of Gardner's study after an interval of 20 years, Sander (1958) confirmed that exposure to finished cement dust did not result in any recognisable X-ray changes, even after upwards of 30 years of exposure. Inhalation of finished cement dust, moreover, does not predispose to tuberculosis or emphysema (Johnstone and Miller, 1960).

Cement dust, therefore, is not a "fibrogenic" dust as silica, for example, is and there is no evidence that it produces the classical dust disease of the lungs. All acknowledged authorities consider it as a nuisance dust which is irritating to the skin, the upper respiratory passages and the eyes. It is in this context that the duration of exposure to cement dust by stevedores assumes a particular relevance. The Maximum Allowable Concentration of cement dust is the same as that of ordinary dust and is set at the high level of 1766 particles per cubic centimetres of air (U.K. Ministry of Labour). This figure relates to average concentrations for a normal working day over an indefinite period so that a person may, with safety and without undue detriment to his health, work regularly in such dusty atmosphere

throughout the year. This would entail an exposure of 2080 hours per annum (a conservative estimate) as opposed to the stevedore's rate of 1801 hours per annum (a generous estimate).

Whereas the thermal environment may change from ship to ship, depending on the type of vessel, the climatic conditions of the moment, the tonnage and manner of stowage of the cargo and the sack temperature, the state of dustiness in the hold may not be so variable and is mainly attributable to the rate of activity of the men involved in unloading the cement bags. This output, dictated in large measure by the men's terms of payment, i.e. at piece-rates, corresponds fairly well for each gang and it can be postulated, therefore, that the level of dustiness in the holds of different ships may not be liable to such wide fluctuations as in the case of the thermal environment.

Conclusion

Taking into consideration all these factors and particularly the fact that spells of exposure were punctuated by periods free from cement dust, we did not feel justified, on the basis of this one aspect of our investigation, to recommend the adoption of the summer manning scale in winter.

Thermal environment in the hold

The factors which contribute to the adverse thermal environment in the hold of a ship carrying cement include:—

- (a) the temperature of the cement which is delivered hot from the calciners and often remains hot on arrival in Malta: at times the sack temperature reaches 130° F. or more and renders the sacks important sources of radiation;
- (b) the type of vessel, often small, wooden-hulled vessels: wood is a notoriously bad conductor of heat;

- (c) the holds themselves: veritable heat traps where the circulation of the air is deficient;
- (d) the method of emptying the hold: the stevedores do not 'skim off' the cargo but, in order to avoid bending and lifting, they 'cut down' to the bottom of the hold where they work standing upright inside an ill-ventilated, sack-walled space in the cargo;
- (e) the general climatic conditions, in particular the hot humid day when the vapour pressure of the environment is such as to interfere seriously with the cooling effect of sweating.

The human factors, moreover, have to be considered — the stevedore's fitness, his acclimatization and energy expenditure. Environmental changes, such as sudden increases in temperature, impose a physiological strain which is reduced by acclimatization. The work of the stevedore is classified as 'moderate' in that the sacks are merely moved sideways from the top of the stack and then lowered down, and not lifted up, into the crane sling. But the output which the stevedores set themselves is high because they are paid at piece rates, the rate of unloading normally ranging between 250 to 270 tons per working day.

In this survey, three assumptions have been made:—

- (a) that measures to ensure the shipment of cement (ex works) at a reasonably low temperature or the ventilation during the voyage of the cement cargo by the provision of vertical and longitudinal shafts in the stacking are beyond the importers' and Port Manager's control;
- (b) that the wider issue of redeployment of the available port workers is not our concern, as indeed it is not; and
- (c) that the stevedores working in the hold are physically fit and fully acclimatized to carry out their allotted tasks.

Materials and methods

In view of the particular significance we attached to this line of the investigation, the thermal environment in the holds of every ship which arrived in Malta during the period under study was assessed by a team from the Occupational Health Unit. The names of the ships have been changed to ensure anonymity and are shown, together with the relative findings, in the Table.

At every assessment, the thermal variables measured were the following:—
 dry-bulb temperature (whirling hygrometer);
 wet-bulb temperature (whirling hygrometer);
 globe-temperature;
 air velocity (Katathermometer);
 relative humidity;
 (sack temperature).

In choosing the types of indices of thermal stress most appropriate for the purpose of this survey, we were guided by the following considerations:—

- (a) the energy-expenditure of the stevedore in the hold;
- (b) the special thermal conditions in the hold;
- (c) the 'sweating' factor in such an environment; and
- (d) the radiation component of the hot cement.

In the light of these considerations, we selected four scales of warmth or heat stress indices to summate the effects of the thermal variables, namely:—

- wet-bulb temperature;
- corrected effective temperature (CET);
- wet - bulb - globe - temperature index (WBGT);
- predicted four-hour sweat rate (P4SR).

The assessment of the thermal environment is essentially the measurement of all the factors concerned, whether they are attributes of the environment, such as air temperature and humidity, or attributes of those exposed, such as their clothing, rate of working and length of exposure. There is no single, all-embracing index which is valid in all the possible complexi-

ties of work rate, air temperature, air movement, humidity, radiant temperature and clothing. Each index has its limitations but, taken in combination and used within their particular sphere of application, thermal stress indices provide an adequate measure of the severity of an environment.

1. *Wet-bulb temperature*

This index takes into consideration two factors, the temperature and the humidity of the air; the effect of air movement and radiation is disregarded. Its great drawback to us was that it ignored the radiation component of the cement sacks; the air velocities registered in the holds were never significant. Nonetheless it provides a fair indication of the evaporative heat exchange through sweating, and was included for this purpose. It was not relied on as a measure of the total heat stress. Haldane (1905) has recommended a maximum wet-bulb temperature of 78° F. for clothed men (not especially acclimatized) doing moderate work in still air.

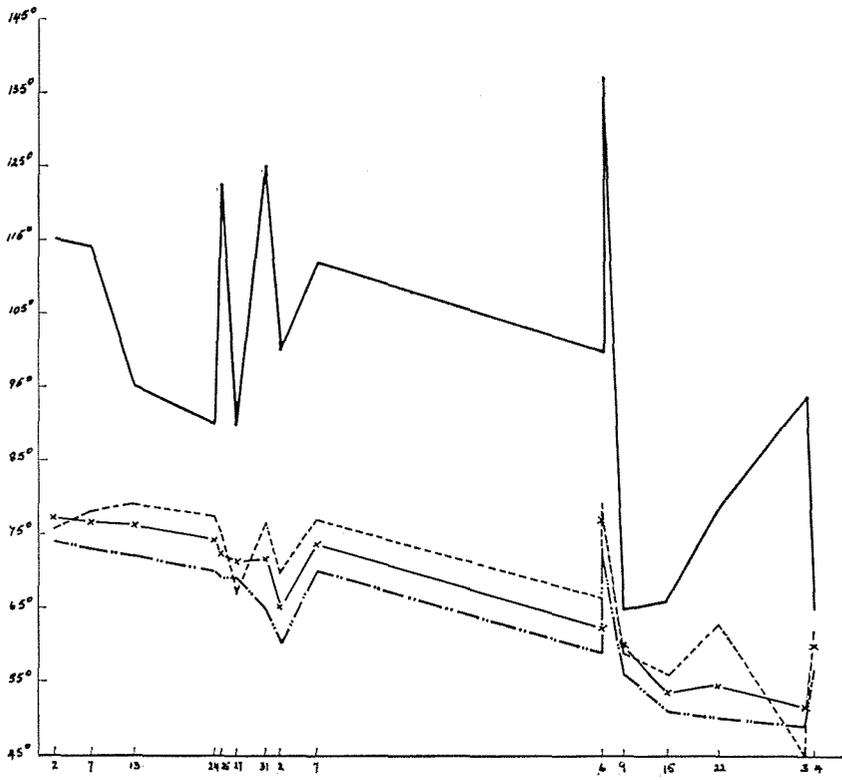
2. *Corrected effective temperature (CET)*

The CET (normal scale) provides, in a single numerical value, a measure of the combined effect of the temperature, humidity and speed of the air in the hold and the radiant heat from the hot cement. It makes, moreover, an allowance for the effect of clothing worn by the stevedores. Without reference to the rate of work of the men exposed, however, CET values are virtually meaningless since they relate only to the climatic stress and do not take into account the metabolic heat production (Leithead and Lind, 1964). Environmental limits in CET values have tended to be set at 86° F. for sedentary and light work (197 kcal./hr.), 82.4° F. for moderate work (325 kcal./hr.) and 79.7° F. for heavy work (454 kcal./hr.) (W.H.O. Report, 1969). The average weight of a stevedore has been estimated at 12 stones (75.6 kg.). On the other hand, Dr. C.G. Warner (personal communication), cognisant of the stevedores' rate of work in the holds, has stated that such a working environment at a CET

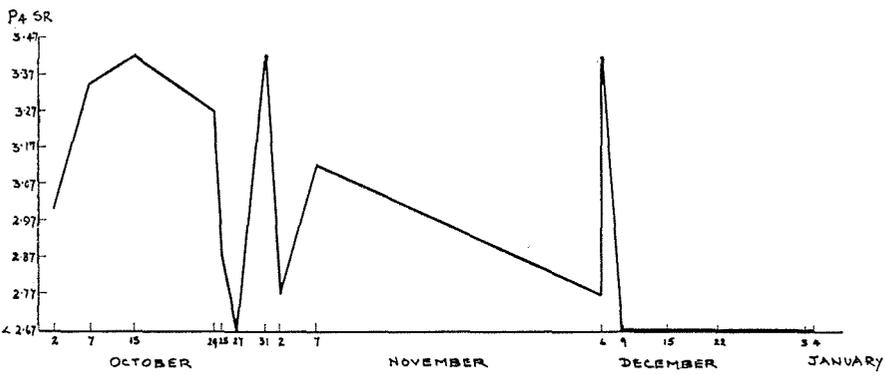
THERMAL FINDINGS IN HOLDS OF CEMENT SHIPS

TEMPERATURE
IN FAHR.

OCTOBER 1967 - JANUARY 1968



_____ SACK TEMPERATURE - - - - - CET
 x — x W BGT - · - · - WET-BULB TEMPERATURE



_____ P4 SR VALUES

OCTOBER NOVEMBER DECEMBER JANUARY
 DAYS AND MONTHS

TABLE

<i>Name * of ship</i>	<i>Date of Test</i>	<i>Wet-bulb temperature</i>	<i>CET</i>	<i>WBGT</i>	<i>Sack temperature</i>	<i>P4 SR</i>
"John"	2/X/67	74°F	75.5°F	77.4°F	115°F	3
"Paul"	7/X/67	73°F	78°F	76.9°F	114°F	3.34
"Paul"	13/X/67	72°F	79°F	76.3°F	95°F	3.42
"Mark"	24/X/67	70°F	77.5°F	74.1°F	90°F	3.27
"Nina"	25/X/67	69°F	75°F	72.4°F	122.5°F	2.87
"John"	27/X/67	69°F	67°F	71.4°F	90°F	2.67
"Peter"	31/X/67	65°F	76.5°F	71.5°F	125°F	3.42
"Paul"	2/XI/67	60°F	69.5°F	65°F	100°F	2.77
"Teddy"	7/XI/67	70°F	77°F	73.8°F	112°F	3.12
"Tony"	6/XII/67	59°F	66.5°F	62.4°F	100°F	2.77
"May"	6/XII/67	72°F	79.5°F	77.3°F	137.5°F	3.42
"Doris"	9/XII/67	56°F	59°F	60.1°F	65°F	< 2.67
"Mark"	15/XII/67	51°F	56°F	53.7°F	66°F	< 2.67
"Fred"	22/XII/67	50°F	63°F	54.7°F	79°F	< 2.67
"John"	3/I/68	49°F	45°F	51.6°F	94°F	< 2.67
"Paul"	4/I/68	57°F	62°F	60.2°F	65°F	< 2.67

* The names of the ships are fictitious.

Thermal findings in holds of cement ships

below 70° F. is entirely acceptable; between 70 to 74° F. CET it becomes uncomfortable and over 75° F. CET it begins to look worrying.

3. Wet-bulb-globe-temperature index (WBGT)

The WBGT embraces, in a single value, the effects of radiation from the sun and the environment, air temperature, humidity and air velocity. It is, to our knowledge, the only index specially designed to measure the exposure to high levels of heat stress out of doors where to the burden of high air temperatures is added the solar heat load. WBGT values between 85° to 88° F. have been considered, in another setting, as the climatic range when heat illness is likely to occur (Minard *et al.*, 1957). We realized, however, as the survey progressed, that the WBGT index was not a happy choice because of the absence of direct sunlight in the hold. Eventually we had to disregard it.

4. Predicted four-hour sweat rate (P4SR)

The P4SR takes into consideration not only the environmental factors of the temperature, humidity and movement of the air, and the temperature of the surroundings, but also the rate of energy expenditure and the clothing worn in the environment. Such an index can obviously be applied best in conditions under which sweating occurs and has been designed with fit, acclimatized men in mind. It is favoured for use in moderate to high heat stress, particularly in situations that remain fairly stable throughout a period of about 4 hours. We reckoned that the one-hour break divided the working day of stevedores into two such situations, and the P4SR was recorded without fail over both morning and afternoon work-periods. The limiting value for P4SR has been judged to be about 4.5 (McArdle *et al.*, 1947). Above this level an increasing number of workers would find the conditions beyond their endurance. A P4SR of 2.5 is, therefore, more easily supportable and reasonable for sustained activity (Warner, 1965).

Work rate

The work data have already been described. From a time-and-motion study of the stevedore's activities in the hold, his energy expenditure was reckoned at 360 kcal./hour. This figure is midway in the range given by Christensen (1953) and quoted by Passmore and Durnin (1955) for men doing moderate work (300 to 450 kcal./hr.) and corresponds closely with the upper limit ascribed to moderate work by Hatch (1967) for an 11-stone (70 kg.) man who is walking about, with moderate lifting or pushing (353 kcal./hr.). It, moreover, stands comparison with the 325 kcal./hr. (W.H.O. Report, 1969) referred to in our discussion on CET limiting values and with the 300 kcal./hr. adopted by Wyndham *et al.* (1967) for moderate work in hot conditions. Nevertheless, the rate of 360 kcal./hr. still remains a generous estimation of the energy expenditure of the stevedores, but it was purposely weighted to take into account their motivation for high speed work and to avoid any margin of bias against them.

Discussion of thermal findings

This investigation has been an attempt to determine the intensity of heat stress imposed on stevedores unloading hot cement at fairly constant rates but in a wide range of thermal hold conditions, and at the same time to state at which month or months in the period under study the stress was such as to have necessitated the halving of the exposure-hours in order to reduce the heat load. Our primary task, therefore, was to establish the upper limits of heat stress which would be applicable to the hold environment.

The epidemiological approach would have been the most realistic, but it could not be used partly because the incidence of heat collapse or of any other form of heat illness (Wyndham, 1965) was not available and partly because the period of investigation was not long enough as to lend itself to statistical analysis. We decided to place reliance on maxima of thermal stress validated in a work-situation as

near to ours as possible and to judge their objectivity in the light of our own experience in the survey.

On the basis of the limiting values generally recommended for the indices we had chosen, we established a critical climatic level above which the environmental conditions would be considered such as to justify the introduction of the shift system. This thermal yardstick was set at a CET of 75°F. and a P4SR of 3; the sack temperature was retained at 110° F. Below these upper limits, i.e. within the prescriptive zone, seven acclimatized and fit stevedores in the hold could unload hot cement for 9 hours a day, at the measured pace and work-load (360 kcal./hr.), in tolerable conditions in which their bodily thermal equilibrium would be maintained without undue strain on the thermoregulatory or other physiological mechanism.

In October, six ships were surveyed. Two had 'climates' just below the upper limit of the prescriptive zone, one of which ("Nina") had a sack temperature of 122.5° F., whilst the other four had 'hotter than prescriptive' climates. The Table shows clearly that only the last week of October offered fairly tolerable thermal conditions to the men in the holds and it started what turned out to be a progressive improvement in the heat stress picture over the remaining period of our investigation. It may be pointed out here that, under the port regulations existing at that time, four of the ships (sack temperature over 110° F.) would have been manned at the summer scale.

In November, only two ships were visited and the thermal environment in one of them ("Teddy") came very near the conditions prevailing in October. Obviously, no definite pattern could emerge and it would be as unwise to incriminate November on the strength of the findings in this one ship as it would be bold to align this month with December in view of the easily tolerable conditions obtaining in the hold of the "Paul" (2/XI/67). Again, it is perhaps quite indicative that the shift system would have been applied to the "Teddy" in accordance with then existing port arrange-

ments (sack temperature 112° F.).

The thermal conditions in four of the five ships inspected during the month of December were satisfactory. The one exception was the wooden-hulled "May" where the thermal environment in the hold was found to correspond with that prevailing in the ships investigated during October. It is worth noting in this connection that readings obtained from the "Tony", which was inspected on the same afternoon as the "May", were quite satisfactory; one important factor which contributed to the exceptional thermal findings on the "May" was the temperature of the sacks which averaged 137.5° F.

Two ships, i.e. "John" and "Paul", were visited in the first week of January, 1968 and the Table shows that the same favourable trend in the thermal environment registered in December 1967 had been maintained.

The Chart shows a definite pattern indicating a gradual amelioration of the thermal hold conditions from the last week of October onwards, assuming a downward curve with two isolated peaks in November and December in the case of the "Teddy" and the "May". The P4SR emerged as a realistic index and correlated best with the severity of conditions obtaining at any particular phase of our investigation. This is not surprising as it expresses the heat stress of any combination of dry and wet bulb temperatures, globe temperature, air movement, level of clothing worn and rate of work. The CET scale has also proved its reliability in an investigation of this kind where the rate of work is practically constant from day to day. Perhaps a greater revelation was the fact that the sack temperature followed fairly closely the thermal environment with the exception of the "Mark" (24/X/67) and the "Nina"; the readings on the "Paul" (13/X/67) need not vitiate this finding as the ship had lain idle for several days due to the general strike in the port.

Conclusion

Following this survey, we were in a position to report that:—

- (1) the summer manning scale should be extended into October;
- (2) the findings in November were equivocal and thus no definite submission in respect of this month could be made other than that the sack temperature would have proved a realistic criterion of the thermal conditions in the holds;
- (3) there was no justification on occupational health grounds to adopt the shift system in December, provided always that the sack temperature did not exceed 110° F.

Subsequent to our report, the Port Labour (Determinations) Order, 1966 was amended accordingly.

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NOTICE

This gazette is published biannually in June and in December. Contributions for the December issue are to reach the Editor, at the Bacteriology Laboratory, St. Luke's Hospital, Malta, by the 1st November. They must be typewritten, with double spacing. References should be given by the author's name and by the year of publication. Articles are to consist of reports of original work or studies or of case histories.

We take this opportunity to thank our advertisers for their appreciation of the value of this Periodical as a medium of reaching the medical and dental professions in Malta.

TRIBUTE AT A TURNING POINT



On the 29th May, the passage of time brought to an end Professor Alfred John Craig's long period of service with the Medical and Health Department as Senior Surgeon in St. Luke's Hospital and with the Royal University of Malta as professor of Surgery. Long observation has convinced us that what matters most in a man is character and personality. Professor Craig's are such that he has set an imprint on his department which will last long and established a standard which will be hard to maintain. Predominantly we would say professor Craig is noted for his carefulness, his meticulous accuracy and the conscientiousness of his work. One seeks, in a note such as this, to omit superlatives, but they come in unavoidably. Professor Craig has for years been the busiest man in Malta yet, again and again, he has surprised his patients by going to see them himself, when he had been thinking over their ailments, instead of letting them seek him out. One patient actually found himself, when the surgeon was himself seriously indisposed and could not look him up, summoned to his bedside to report on his health.

The greatest gifts a surgeon can have are neatness and precision and these are manifest in this case in many ways, even in an admirably clear calligraphy. Professor Craig invariably gives of his best. With his students he desired to share all his vast experience: he tried to and often succeeded in making surgeons of them. In some cases, there was the odd complaint that he taught his students too much. Obviously his pearls had occasionally been cast before the wrong recipient, but most of his students nourish the deepest gratitude for his zeal. When an idiotic visiting examiner (incredibly, in a subject other than surgery) lamented that too high a number of students failed their surgery paper, professor Craig could only note that if other persons, victims of permissive times, had lowered their standards, he had never seen it fit to lower his. The statement has been made that he prepared his students as if they were going in for the Fellowship exam; whether this is interpreted as praise or blame will reveal the character of the interpreter himself.

In spite of his having to carry on his own slender shoulders the heaviest bur-

dens of so many in the island community, John Craig has never lost an impish sense of humour, nor his love of poetry. His colleagues have also often been surprised to find him relaxing in short intervals between operations by reading philosophy.

Kipling has said that what a craftsman desires beyond anything else is the approval of his fellow workers. That this regard John Craig has in full measure is shown, not by words, but by the plain fact that it was to him that so many of his colleagues have, to put it plainly, entrusted their own lives and that of their dear ones. It is possible that, in a busy life John Craig has not read R.K.'s "Book of Words" or that he has forgotten that particular passage, so it struck me, when, recently, asking him how I could ever repay him for giving me back my health, he answered off hand that what he liked most was knowing he enjoyed the confidence of his colleagues. Full circle.

So, one who has known him long, since the days when, in Bloomsbury, he helped him celebrate his success in the first part of the F.R.C.S. exam, wishes him and his family, with a stark sincerity, on behalf of the innumerable friends and patients whom he has so vastly benefited, continued success and happiness in the phase of life and work which now lies opening ahead.

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BOOK REVIEW

The Prevention of Complications in Dental Surgery. By H. C. Killey and L. W. Kay. (Pp. 228 + vii; illustrated. 35s.) Edinburgh, E. & S. Livingstone. 1969.

The paperback series by Killey and Kay is by now part of the complete dentist's armamentarium, essential to the dental student and practitioner alike and invaluable to the university lecturer. The latest issue is on the prevention of complications in dental surgery and is well up to the established high standard. The nine chapters cover complications which may occur in the dental surgery during routine treatment; oral surgery; local anaesthesia; out-patient's general anaesthesia; patients admitted to hospital for surgery under general anaesthesia; anaesthetic complications as they affect the surgeon; serious complications following misdiagnosis or radiography; drug therapy and ethical and medico-legal complications.

The text is clear, exhaustive and easy to read, although something has gone wrong with pages 183-185. The risk of osteoradionecrosis following dental extraction in persons who have undergone radiation treatment in the oro-facial region, especially for nasopharyngeal carcinoma, should have been stressed. The illustrations are few but useful and to the point. The text is even more forcefully clarified by pertinent case histories culled from the annual reports of the Medical Protection Society. It is a pity that the judgement is not always given, so that the reader is sometimes left unsure of the culpability of the unfortunate dentist.

An appendix listing the drugs and equipment which should be available for emergencies would have been useful. These small points do not detract from the excellence of the publication, which should be in the possession of all dental surgeons. Frequent references to this handy book would help to prevent many complications both trivial and serious.

G. E. C.

MEDICAL NEWS

We congratulate:

Professor Arthur P. Camilleri and Dr. Edgar Agius on their election to the Fellowship of the Royal College of Obstetricians and Gynaecologists last February;

Dr. J. A. Giglio and Dr. A. Vassallo on being awarded the Diploma in Industrial Health in January after taking Council of Europe fellowships.

Dr. Joseph Muscat Baron on his recent appointment as Consultant Physician and Cardiologist to the Halifax Group of Hospitals in England;

Dr. Herbert M. Gilles, senior lecturer in Tropical Medicine at the University of Liverpool on his election to the Fellowship of the Royal College of Physicians last April;

Professor Victor G. Griffiths for being elected in April, a Fellow of the British Medical Association. (A similar honour was given to the editor of this periodical). It is the first time these honours have been conferred on residents outside the British Isles.

Dr. Francis X. Micallef on his appointment in May to the post of Consultant Anaesthetist at St. Luke's Hospital.

Professor William Bannister on the grant to the university department of physiology of the sum of £11,000 by the Wellcome Trust. This is obviously a sign of appreciation of his work by high authorities.

Dr. Anthony Grech, of Sliema, now Surgical Registrar at Redhill General Hospital, Redhill, Surrey and Dr. Norman Vincenti of the R.A.F., a Wing Commander stationed in England, on their being elected Fellows of the Royal College of Surgeons.

We record that the B.M.A. (Malta Branch) prize for an essay on a medical subject has this year been shared by the late and greatly lamented Dr. John R. G. Agius for his essay on "Alopecia in the Beard Area" and Dr. Paul Cassar, the acknowledged historian of the medical profession in Malta, for his work entitled: "The Church on Caesarean Section in Malta in 1867".

The Moynihan Chirurgical Club held a two-day conference in Malta, after a visit to Rome, on the 8th and 9th May. Members arrived on the 7th and they used the extra day to commemorate the first Lord Moynihan, by unveiling a plaque to his memory by the side entrance of the house where he was born. His Excellency the Governor-General carried out the ceremony; the house is a small one, one of an old set, a little away from the Villa Rosa beach club, just outside the limits of St. George's Barracks. The tablet reads:

BERKELEY GEORGE ANDREW MOYNIHAN
1865-1936
1ST BARON MOYNIHAN OF LEEDS
K.C.M.G., C.B., M.S., P.R.G.S.
SON OF CAPTAIN ANDREW MONYIHAN V.C.
8TH. KING'S REGIMENT OF FOOT
AND ELLEN ANNE (PARKIN), HIS WIFE
WAS BORN HERE.

At meetings held at the medical school the following papers were read:

Dr. P. Cassar: "Malta 1865 — Medical background and Berkeley Moynihan".

Professor A. J. Craig: "Cases of renal tuberculosis".

Professor V. G. Griffiths: "A case of Peutz-Jeghers syndrome".

Mr. J. A. Muscat: "Review of tetanus in Malta".

Mr. J. B. Pace: "Three cases of recurrent tetanus".

Mr. A. J. Warrington: "Results of biliary operations without operative cholangiography".

Mr. V. P. Amato: "Skeletal changes in cases of congenital indifference to pain".

Professor G. P. Xuereb: a) "Some aspects of tumour spread"; b) Case demonstration — "Sarcoma of stomach".

Dr. J. L. Grech: Case demonstration — "Carcinoma of liver".

Dr. H. Sultana: "Incidence and treatment of carcinoma of lip in Malta".

Mr. G. Camilleri: "Radionecrosis of the mandible".

Professor V. G. Griffiths: "Remembrance of things past — a case of perineal lithotomy".

A number of social events completed the conference, which was very successful.

Highly qualified Maurice N. Cauchi, who joined the University department of Pathology in January 1968 resigned from it within the year. He has since accepted an appointment at the new Monash University in Australia.

Dr. Donald Sultana, now a lecturer in English at Edinburgh University, has published an extensive study on "Samuel Taylor Coleridge in Malta and Italy" (Blackwell, 84s.). This is a magnum opus of over 400 pages, a standard work richly documented, which is obviously the result of long study. Quite apart from its literary value and some medical interest in connection with Coleridge's opium habit, the work is of enormous historical value since Dr. Sultana sketches in the historical background in minute detail. The period covered is 1804-05, years crowded with diplomatic activity. No collector of melitensia can afford not to own this volume in which 13 interesting plates are reproduced.

Dr. E. S. Grech, senior lecturer in Obstetrics and Gynaecology, Makerere University College, Uganda, was the recipient in 1967-68 of a travel grant from the Carnegie Corporation of New York to study gynaecological surgery and medical curricula in the U.S.A. and Canada.

Rear Admiral Dudley P. Gurd, the ophthalmologist who was in command at Bighi, retired from the Navy and from Bighi on the 1st May. His native city, Belfast, will be conferring on him the degree of Doctor of Science, *honoris causa*. In conformity with the new lunatic policy of the British Government of downgrading everything, the new commandant at the R.N. hospital will be a Captain, not an Admiral.

We were interested to learn that Dr. Edward James Turner ('60) has, by way of a Fulbright Scholarship at Boston Children's Hospital and a year in Pediatric Haematology at Montreal's Children's Hospital, found his way to Edmonton in Alberta, Canada, where he has been in general practice for the last six years. He has met, a few months ago, Frank Vella, now of Saskatchewan. Quite a reunion since they had not seen each other for 16 years. Eddy is on the attending staff of the

Royal Alexandra Hospital, the Edmonton General and the Misericordia Hospital, besides being involved in a lot of other medical and paramedical activities. In November, he listed his assets as "one wife and two and a half kids". By now we hope the family is complete, so far. Anybody who passes 14358 Park Drive, Edmonton is welcome to drop in. The only essential for getting a good cup of tea is to make your way to Alberta.

Paul Azzopardi is a pediatrician at the Scarborough General Hospital in Toronto. Freddie Demanuele of Toronto, has specialised in, of all things, computerised medicine. Francis Borg is Chief Anaesthetist at the Humber Memorial Hospital, Toronto. Godfrey Fiorini is in general practice, having links with St. Joseph's Hospital, Toronto. He has a paper on "The Inflammatory Theory of Pregnancy" coming out in the "Canadian Family Physician". A few weeks ago he was home on holiday and we enjoyed his visiting us.

This semester we had professor Heinz Stowe lecture to the B.M.A. on the 30th January on "Structural changes in the age composition of lung cancer mortality in the federal republic of Germany"; professor R. A. Morton, Emeritus professor of Biochemistry at Liverpool, lectured on "Vitamins today" on the 20th March. On the 3rd January, Sir Terence Cawthorne lectured to the B. M. A. on "Vertigo". Sir Terence is consultant E.N.T. Surgeon to King's College Hospital and Consultant Aural Surgeon at the National Hospital for Nervous Diseases in Queen Square, London. Mr. Gordon McLachlan, secretary of the Nuffield Provincial Hospital Trust spoke to members of the Medical Faculty on the 3rd April on "Financial Backing for Schemes of Medical Care and other Medical Projects".

The Council of the University has appointed Dr. Alfred Cuschieri and Dr. Roger Ellul Micallef to be full-time Assistant Lecturers in the departments of Anatomy and of Physiology and Biochemistry respectively. They have both been awarded university scholarships and are expected to proceed abroad in October for post-graduate studies.