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The Chest-Piece

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(Malta Branch)

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EDITORIAL

Thus we come to another issue of "The Chest-Piece". We must apologise for our late appearance—the only excuse for which is the hackneyed 'unforeseen circumstances'. Anyone who has any share in publishing such a journal will know what we mean.

We welcome Dr. Wiedemann's contribution on B.C.G. Vaccination. Now that Malta is partaking in the International Tuberculosis Campaign, it is only right that we should publish something on B.C.G., especially by someone who has had such experience with the subject as our contributor. As Dr. Wiedemann points out, medical students stand a good chance of meeting with open tuberculous lesions in the wards and clinics, and thus their chances of getting the virulent disease are appreciably large. This, we hope, will help in opening the eyes of our students, who attend clinical work without being tested for immunity against anything, because of the absence of a student Health Scheme of any nature.

Again we have had the usual unflinching support from Dr. Cassar who writes about The Concept of Mental Disorder in Maltese Traditional Lore; from Dr. Agius who gives us The Truth about Bacterial Warfare, and from Dr. Captur who reviews and criticises some theories about The Origin and Evolution of Life.

Newcomers to the journal include Dr. Azzopardi, whose article on The Parturient with Delay in Delivery makes us look forward to other contributions from his pen, and Dr. Callus who gives us a case report on Lymphadenoma of the Spine. This subject is also dealt with by Dr. Lanfranco in his Nitrogen Mustard Therapy in Hodgkin's Disease. For the elucidation of these last writings, we have included two X-Ray photographs and temperature curves. This, we hope, is a sign of the journal's progress.

Unfortunately past issues of "The Chest-Piece" may have given the impression that it is a medium for articles by well-known medical men

only. This is very far from what we intended. While maintaining the highest standards possible we aim at making this journal interesting to junior and senior medical students, as to the maltese medical profession. For this aim to be achieved we need your suggestions, your correspondence, and your problems as far as they are connected wth your medical studies.

It is not for us to suggest subjects on which students can write. We know too well that the student's field is limited. Only, we think that the clinical students could help us with their case histories. Others might venture into the realm of history of medicine which has now-a-days attained such importance. So long as your writings are of interest to medical students and others in the medical field, and as they are an expression of medical student thought, we shall be glad to have them.

In the next number we intend holding a feature entitled Why I Joined a Medical Course. For this we need students, senior and junior, male and female, to give us their various reasons for taking the first step towards getting themselves established in the medical profession.

CONTRIBUTIONS

All members of the Medical Profession and all Medical Students are invited to contribute to "The Chest-Piece". Correspondence and contributions should bear the signature of the author (not necessarily for publication), and should be addressed to:

The Editor of "The Chest-Piece"
26 Cathedral Street,
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B. C. G. Vaccination

Dr. Andreas Weidemann

Chief of Mission to Malta,

International Tuberculosis Campaign.

Tuberculosis is still one of the greatest scourges of mankind. As physicians, present-day medical students will in the future have to take part in the fight against this disease, both in prophylactic work in the homes, and by treating this disease in hospitals.

The B.C.G. vaccine was produced for the first time by Professor Calmette and his pupil Guérin in 1921, from a bovine-type of the tubercle bacillus, after this had been cultured for thirteen years in a special medium. During these years the bacillus had lost entirely the power to produce tuberculous disease, but without losing the usual ability of a tubercle bacillus to develop a relative immunity or power of resistance against the tuberculous contagion.

The vaccine, having been tried for many years on animals, was in 1921 given to new-born babies by oral administration. (Weill Hallé 1921, (1)). However, it was proved in a statistical way, that only 30% of the babies, vaccinated with this oral administration, were sensitive against tuberculin, and therefore this form of administration lost much of its epidemical value. (Wallgren (2), Greenwood (3), Rosenfeld (4)). Besides, the Lubeck tragedy made the oral methods unpopular, in spite of the fact that this tragedy was not due to the B.C.G. vaccine, which fact was definitely proved by the German Law Courts (Lange (5)).

It was the Scandinavian physicians Heimbech (6) and Wallgren (7) who were the first to use the parenteral administration — Heimbech by subcutaneous and Wallgren by intradermal injections.

The intradermal method proved to be the best one and it is now the standard method in use everywhere. Some other methods (Rosenthal's multi-puncture (8) and the scarification method of Negre and Bretey (9)) have been used to a certain extent.

By vaccinating non-reactors to tuberculin, we can convert them into reactors to tuberculin in a very high percentage of cases (98% to 99%). That means that we can give the non-reactors the same protection against tuberculosis, as the reactors to tuberculin have obtained through a natural (but often dangerous) infection.

Many experiments have been carried out to determine the degree of protection given by the B.C.G. vaccine. The difficulty in these experiments has always been to get really good control groups. In order to prove the effect of the vaccine, we should have a relatively large group of non-reactors to tuberculin, of which every second person — chosen absolutely at random — should be given B.C.G. vaccine and the others left as controls. The whole group (B.C.G. vaccinated and controls) should live under exactly the same conditions and be controlled in the same way. If the B.C.G. vaccine gives protection, fewer cases of tuberculosis will occur among the vaccinated than among the controls.

In practice, it is almost impossible to carry out a study where these strict conditions for control are fulfilled to such a degree that all statisticians will be satisfied.

Of the controlled studies which come closest to the theoretical conditions, the following can be quoted:—

1. Heimbech (6) in the years 1924-

1926 on probationers entering the nursing school of the Ullevaal Hospital in Oslo, had seen that while many of those who did react to tuberculin became ill with tuberculosis at an early stages of their training, only few cases developed among those found to be reactors to tuberculin on admission. Prompted by this experience, Heimbech began B.C.G. vaccination of the non-reactors among his nurses in 1926 and today he is still following up most of them. Among the probationers entering the school in the period 1924-1936 for a three-year training course, 668 were found to be reactors to tuberculin on admittance, 501 were non-reactors and B.C.G. vaccinated, while a further 284 non-reactors were not vaccinated. The following rates of morbidity and mortality were calculated for the three groups per 1,000 observation years: for the reactor group the rates were 12.4 morbidity, 0 mortality (22 cases of tuberculosis, including such forms as: erythema nodosum, pleurisy, etc., and no deaths), for the vaccinated 24.1 and 2.1 (35 cases, all forms included, and 3 deaths) and for the non-reactor group 141.2 and 14.6 (97 cases and 10 deaths). Both morbidity and mortality appear very high in the latter group; and Heimbech stresses the fact that among the nurses who were vaccinated, the incidence of tuberculosis has been reduced to one sixth.

2. Wallgren (7), a pediatrician, was the first to show the importance of B.C.G. in the control of tuberculosis in a community. Injecting all the children of tuberculous families and those exposed to infectious sources in the town of Gothenburg in Sweden, he obtained a sudden drop in the mortality rates from tuberculosis in the younger age groups. Whenever possible, the children were isolated from the source of infection for six weeks before and after vaccination until allergy had developed. Thus a total of 1,069 persons were given B.C.G. intradermally in the period 1927-37 in Gothenburg alone. Anderson and Belfrage in 1939 made a study of this material, and were able to examine 905 vaccinated persons. They found that tuberculous disease had developed in two cases only, and in a benign form. Furthermore, a small child had died from a specific primary infection, with generalisation, which had developed three weeks after vaccination. This child had not been isolated prior to the vaccination, and it must be presumed that B.C.G. had been inoculated in the incubation period.

3. R. G. Ferguson's (10) observations on vaccination of general hospital nurses and of sanatoria nurses showed that the protection given by B.C.G. would apply as well to the groups with a high annual in-

B.C.G. Vaccination in Hospitals and Sanatoria of Saskatchewan (R. G. Ferguson).

(1934-1943)	Number of persons	Tuberculosis cases	% with Tuberc.	Aver. years observed.
Nurses in general hospitals (Yearly infection rate of 11.8%)				
Positive on entrance	478	5	1.05	2.43
Negative, not vaccinated	1,368	55	4.02	2.43
Negative, vaccinated	1,005	9	0.89	2.42
Nurses in Sanatoria (Yearly infection rate of 71.8%)				
Positive on entrance	293	11	3.75	1.25
Negative, not vaccinated	113	18	15.9	1.06
Negative, vaccinated	203	5	2.46	1.07

fection rate (sanatoria nurses: 71.8%) as to the groups with a much lower annual infection rate (general hospital nurses: 11.8%).

Comparison of the percentage of cases developing a tuberculous disease in the vaccinated and non-vaccinated groups shows a ratio of 1:6.5 for the more exposed nurses, and of 1:4.5 for the less exposed nurses who had received B.C.G. Such a marked reduction can hardly be attributed to mere chance or to the annual decline of the death and case rate in Canada.

4. In the years 1935-1938, Aronson (11) in the United States started in 13 different Indian reservations, scattered from Arizona to Alaska, what was to become one of the most accurate studies on B.C.G. 1,551 North American Indians were vaccinated with B.C.G. and 1,457 were kept as controls. All the subjects chosen for the experiment were in the age-group 1-20, and the division between those to be vaccinated and those to be followed up as controls was made quite at random. All the subjects were re-examined annually by tuberculin tests and radiography. The specialist reading the X-ray films did not know to which group a given subject belonged. The two groups were found to be similar in age distribution, amount of exposure to tuberculous infection and completeness of the follow-up.

When the results of the Indian study were first published after 6 years of observation, there were 28 deaths due to tuberculosis among the controls as compared with only 4 such deaths among the B.C.G. vaccinated. This is a rate of 3.4 against 0.4 per 1,000 person years, with a ratio of 1:7.7 in favour of the vaccinated. The total incidence of tuberculosis, that is, the sum of all the cases and all the deaths due to the disease, was 185 in the control group and 40 in the vaccinated group; a rate of 24.3 as against 4.7 per 1,000 person years, or 1:5.2 in favour of the vaccinated.

5. Quite exceptional are the observations by Hyge (12) in a Danish school for girls, and his findings have been compared to those of a controlled laboratory experiment on human beings. Following the discovery of an open case of tuberculosis among the pupils, the whole school population of the Aurehoj State School was X-rayed and tuberculin tested in November 1941 and again in February 1942. At this date 144 girls out of 200 non-reactors to tuberculin volunteered for vaccination and were subsequently found to be reactors to a control tuberculin test. A new examination took place in December 1942 and of the 368 pupils examined 105 were found to be non-reactors to tuberculin, 130 reactors after natural infection, and 133 reactors after B.C.G. vaccination. About two months later, in January and February 1943, an influenza-like epidemic broke out among the school girls, beginning with several cases of erythema nodosum. After a renewed, thorough examination, the source of infection was found to be a teacher of science who held classes in a damp, permanently blacked-out cellar. Some of the classes had not been in contact with the teacher in question, so that out of the total 105 non-reactors, 94 had been exposed and 70 of them had become reactors (74.5%). Of these inverters, 41 showed X-ray changes of the thoracic organs and 37 had a positive gastric lavage. In 11 cases, that is 11.7% of the exposed subjects, a progressive pulmonary tuberculosis developed, followed by death in one case. Among the 133 vaccinated, 102 had been in contact with the infectious source, and only two cases of tuberculosis developed (1.9%). The only girl who had lost allergy after vaccination also suffered from a mild form of the disease. No other cases were found in 5 years of observation in this group. In the group of 130 who were originally reactors to tuberculin, 105 had been exposed, and four cases with positive gastric lavage were found.

Thus we find that most of the experiments on human beings which can be subjected to statistical analysis give a percentage varying between 70-100 of protection to those who are vaccinated (Irvine (15). This evidence has now been accepted universally, and the use of vaccination in the fight against tuberculosis is no more a matter of faith as it was in Calmette's day.

After many years of study and trials, B.C.G. vaccination passed from the experimental phase to practical application in the field of tuberculosis control.

In the spring of 1947, a tuberculosis relief action was started from Denmark through the Danish Red Cross in several European countries. We thought it our duty to make available to the countries where the B.C.G. vaccination was so badly needed, our experience in the practical execution of B.C.G. mass-vaccination programmes, as well as the vaccine and tuberculin necessary. In 1947 more than one million people in six different European ccuntries were tuberculin tested by Danish personnel, and more than 29,000 non-reactors to tuberculin were B.C.G. vaccinated.

In the spring of 1948, the relief organisations in the other Scandinavian countries (Swedish Red Cross and Norwegian Help for Europe) joined the action initiated by the Danish Red Cross, and it then became a joint Scandinavian programme.

In the beginning of 1948, the United Nations International Children's Emergency Fund (U.N.I.C.E.F.) became interested in the B.C.G. vaccination programme, and on 12th March, the Executive Board of U.N.I.C.E.F. allocated the sum of 4 million Dollars for a B.C.G. vaccination programme; 2 million Dollars for the B.C. G. programme in Europe, and 2 million Dollars for the work outside Europe. The actual execution of the B.C.G. programme was left to the Danish Red Cross, acting also on behalf of its other Scandinavian associates. This complicated undertaking was called "The Joint Enterprise". The World Health Organization has, of course, shown great interest in this international programme and is giving technical advice through its Tuberculosis Expert Committee, and especially through the "Sub-Committee on Tuberculin Testing and B.C.G. Vaccination".

Therefore it will be understood that this is a real international fight against tuberculosis which rightly deserves the name "International Tuberculosis Campaign".

For a mass-vaccination programme with B.C.G., it is necessary not only to have experience in the organization of the programme, in the technique of tuberculin testing and application of the vaccine, but also to have a vaccine that has been carefully tried out. Production of a good and well-controlled vaccine is a speciality in which considerable experience is needed. The vaccine must not be so strong that it causes complications, but on the other hand it must be strong enough to be effective in inverting at least 98% to 99% non-reactors to tuberculin into reactors. Only with such a strong vaccine can the allergy and protection produced, last for a considerable period of time. Such a vaccine is available from Denmark, Norway and Sweden in practically unlimited amounts. For the tuberculin testing prior to the vaccination, well-standardised tuberculin must be used, and this is alsc available in practically unlimited quantities.

Only persons showing no reaction to a tuberculin test — the so-called "non-reactors to tuberculin" — shculd be given B.C.G. vaccination. These non-reactors have either never been infected with tubercle bacilli, or the tuberculous infection which they might have had has taken place so long ago that they have either no antibodies against tubercle bacilli at all, or too small a quantity of anti-bodies to give any protection worth mentioning against tubercle bacilli. The B.C.G. vaccine can invert the non-reactors to tuberculin into reactors.

The B.C.G. vaccination will be of no use to persons giving a positive reaction to tuberculin (reactors to tuberculin). Such persons have already obtained, by a natural infection, sufficient antibodies to give them a certain protection (immunity). B.C.G. vaccine is not harmful to such persons, but it might cause some inconvenient complication—(Koch phenomena). Great experience has shown that there is no danger in giving B.C.G. vaccine, even to a person with a case of tuberculosis.

The tuberculin test before the vaccination is made for three reasons:—

1. To eliminate from the vaccination cases of tuberculosis. That means the tuberculin test should be such that practically all the cases of tuberculosis will be reactors.

2. To avoid "Koch phenomena".

3. To divide the population into two groups:—

(a) the persons having immunity enough from natural infection.

(b) the persons needing to have their allergy and immunity increased by vaccination.

The tuberculin test before the vaccination is made in order to protect the reputation of the B.C.G. vaccine. If B.C.G. is given to reactors to tuberculin, we can never be sure that cases of tuberculosis will not be vaccinated also. If that happened, and the case of tuberculosis was diagnosed shortly after the vaccination, the vaccination might be accused of having caused the disease.

If B.C.G. vaccination is made on tuberculin-sensitive persons,some of them will develop the so-called "Koch phenomena", a red, sore infiltration around the site of the vaccination. appearing one or two days after the vaccination has been made and looking very much like an infection with such germs as streptococci. These Koch phenomena are not dangerous, but they are most inconvenient, and will often be erroneously interpreted to mean that the vaccine has been contaminated with ordinary pyogenic germs.

We know that reactors to tuberculin would not benefit from B.C.G. vaccination, that there will be cases of tuberculosis among the reactors, and the Koch phenomena will occur among the reactors. There is therefore no sense in giving B.C.G. to reactors to tuberculin; to do so would soon make the vaccination unpopular.

In the Campaign in Malta we are using **Adrenalin-Pirquet-Test.**

Standardised tuberculin (1.7x International Standard), to which Adrenalin has been added (1 drop 1% Adrenalin solution to 1 cc. tuberculin), is used for this test. By adding Adrenalin, the test is made more sensitive, which means that a greater number of specific reactions are obtained, and that positive reactions are larger and therefore easier to read. The Adrenalin will lose its effect after some time, and, therefore, the mixture cannot be used more than one week after its preparation.

The test is made on the middle third of the volar side of the left forearm. With a vaccination needle (which should not be too sharp), a scratch half to one cm. long is made through the epidermis, but not so deep that any bleeding results. A little bleeding after the tuberculin has been applied seems to be of minor significance. The most common failure is to make the scratch too superficially. A drop of Tuberculin-Adrenalin is rubbed into the scratch with a glass stick. The drop of tuberculin is allowed to dry for at least five minutes before the arm is covered.

The reading of the test is made on the third day. The infiltration and redness are measured where the reaction at the site of the scratch is largest. Positive reactions must show infiltration of at least 4 mm. Reactions with a diameter of 2-3 mm. are regarded as doubtful and infiltration of less than 2 mm. as negative.

The technique of testing and vaccina-

tion is not difficult, but the work has to be done very accurately, and the personnel have to be instructed in detail. The little complications which may arise are mostly due to some carelessness and a little rough technique.

In a very few cases, the local lymph node, usually located in the axillary or subclavicular areas, will enlarge, be a little sore and — in rare instances — even form an abscess. These lymph node abscesses usually develop 2 to 3 months after the vaccination.

If the examination of a vaccinated person reveals that a definite lymph node abscess has developed, a single puncture with aspiration of the abscess should be made. After such an aspiration (in some few cases repeated a month later), this abscess will heal by itself without bursting. It sometimes happens, however, that the vaccinated person does not report to the doctor until the abscess has burst. In this case, no special treatment should be given and especially incision of these lesions should be avoided. It must be remembered that these lesions heal by themselves and should not be considered and treated as ordinary tuberculous abscess.

As mentioned before, complications resulting from the intradermal vaccination are extremley rare. In Denmark we have found only one case in each two thousand persons vaccinated. Nevertheless, people who are to be vaccinated should be warned that such complications may occur, otherwise they will be frightened if a complication does occur.

In the Scandinavian Countries we have great faith in the B.C.G. vaccination, and as you may perhaps know we have compulsory vaccination for several groups of the population.

We have seen the best results among adults between 15 and 25 years old among students, nurses, soldiers and young labourers, living close together in schools, camps and factories. We are sure that the B.C.G. vaccination has saved many of these young people from the "white plague".

The B.C.G. vaccination is of special importance to medical students, who during their hospital training have to work among the tuberculous patients, at an age, when the natural infection produces 10 times more cases of tuberculosis than in early childhood.

It is my wish that medical students in Malta will use a little of their valuable time to obtain a sound knowledge about B.C.G. Vaccination, so that they may be in a position to tackle successfully any difficulty with which they may be confronted on the matter.

BIBLIOGRAPHY.

(1) Weill-Halle, B. Turpin, R.
Premiers essais de vaccination anti-tuberculeuse de l'enfant par le Bacille Calmette Guerin (B.C.G.)

(2) Wallgren A.
Observations critiques sur la vaccination antituberculeuse de Calmette, Acta Paediatrica, 7, 120, 1927.

(3) Greenwood, M.
Professor Calmette's statistical study of B.C.G. vaccination. British Medical Journal, 3514, 2, 793, 12 May, 1928.

(4) Rosenfeld, S.
Der statistische Beweis fur die Immunisierung Neugeborener mit B.C.G. Wiener klinische Wechenschrift, 41, 800, 1928.

(5) Lange, L., Pescatore, H.
Bakteriologische Untersuchungen. Die Sauglingstuberkulose in Lubeck. (Reichsgesundheitsamt, Jul, Springer Verlag 69, 1935).

(6) Heimbech, J.
B.C.G. vaccination of nurses. (Tubercle, 29, 4, 84-88 April 1948).
(7) Wallgren, A.
Value of Calmette vaccination in prevention of tuberculosis in childhood. (Journal American Medical Assn. 103, 2, 1341, 1934).
(8) Rosenthal, S.R.
The multiple puncture method of B.C.G. vaccination. (American Review of Tuberculosis, 39, 128—134, 1939).
(9) Negre, L. Bretey, J.
Vaccination par le B.C.G. par sacrifications cutanees. (Masson & Cie, Edit. Paris IInd Edit. 1947).
(10) Ferguson, R.G.
B.C.G. vaccination in Hospitals and Sanatoria of Saskatchewan. (American Revue of Tuberculosis 54, 325 Oct. Nov. 1946).
(11) Aronson, J.D., Palmer, C.E.
B.C.G. vaccination among American Indians. (Public Health Reports, Washington, 61, 23, 802, 7 June 1946).
(12) Hyge, T.V.
Tuberculosis epidemy in a Stateschool. (Acta Tuberculosa Scandinavica, 21, 1-56, 1947).
(13) Hyge, T.V.
The efficacy of B.C.G. vaccination. (Acta Tuberculosa Scandinavica 23, 153-155, 1949)
(14) Andenaes, O.M.
Nord. Med. 39 (1948-1676).
(15) Irvine, K.N.
B.C.G. vaccination in theory and practice. (Blackwell Scientific Publ., Oxford, 1949 — page 116).

"If the head and the body are to be well, you must begin by curing the soul... This is the reason why the cure of so many diseases is unknown to the physicians of Hellas because they are ignorant of the whole which ought to be studied also; for the part can never be well unless the whole is well".

PLATO.

THE PARTURIENT WITH DELAY IN DELIVERY

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There is a heavy responsibility which may unobtrustively come to rest on the practitioner attending a woman with delay in labour, and real difficulty may arise in the management of such a case. The subject is beset with uncertainties. No dogmatic statement can be made about the duration of a labour which will go to end spontaneously. The average length of the first stage of labour is 16 hours in primiparae, and 12 hours in multiparae; the second stage lasts $1\frac{3}{4}$ to 3 hours in primiparae, and $\frac{1}{4}$ to $\frac{1}{2}$ hour in multiparae. Averages of the duration of the first stage however, do not give a satisfactory picture of the length of an individual labour, for extremes are not rare and may range from one hour to several days. There are a number of varieties of prolonged labour. The pains may be weak and infrequent throughout; they may be steady and progressive initially, but later pale off and become rare; they may be scarce to start with and then recur more frequently and increase in effect and power; they "may intermit, an interval of hours or days occurring after the pains have begun and dilatation of the os has been effected".

Several conditions which may delay delivery can be diagnosed by careful clinical and radiological examination, but in an important group of cases there is often uncertainty about the causative factors. This subject therefore is a very important one and calls for the best practice of the finesse and the finer points of the art of obstetrics. From students it is worthy of particular attention, because in a crowded curriculum, students seldom have the opportunity of following uninterruptedly such cases from onset to outcome, and also because in hospital they most likely see only those cases which have been grossly mismanaged before their admission.

During labour the uterine muscle fibres exhibit two most important phenomena, namely, contraction and retraction. Contraction is that function by means of which the cervix gets dilated during the first stage, and by means of which the foetus is progressively expelled through the birth canal. Retraction is that function by which the muscle fibres remain permanently shortened when the contraction has passed off, and it therefore maintains any advance of the foetus which the contraction has brought about.

The uterine contractions have certain characteristics: 1) they are involuntary although they are influenced by states of the mind; 2) they last from 30 to 90 seconds; 3) they are intermittent; the intermittence serves to aid the circulation in the uterus and in the foetus, and it brings about succulence of the cervix and vagina thereby acting as a means of "vital dilatation", also serving to provide sufficient rest for the contracting muscle; 4) they are rhythmic, the interval between the contractions being gradually shortened till the escape of the head from the vulva, when they become more or less continuous; 5) they exhibit three phases — increase, acme or apogee, and decrease; 6) they are painful and the first pains are felt in the back, "pains in the kidney"; the pain is mostly due to stretching of the cervical tissue and probably also to pressure on nerves in cervix and body; it is greatly influenced by emotion. As delivery is a physiological function, ob-

stetricians are at a loss to explain why labour contractions should be painful.

The term "delay in labour" is here used comprehensively to include those cases in which delivery is prolonged, whether during the first or second stage, or whether before or after the rupture of the membranes. The terms "primary uterine inertia" and "sluggish uterus" occur in text-books to denote feebleness of uterine contractions. The term here adopted, includes anomalies of uterine contractions due to functional or structural causes whereby contractions are infrequent, feeble, too short, irregular even though strong, or for any reason inadequate, as well as anomalies of the abdominal powers. It does not include cases of arrest of labour due to "uterine exhaustion"—often termed "secondary uterine inertia" — which is the result of gross mismanagement of obstructed labour, or the terminal phase of inherently weak pains.

Delay in labour is not due to impairment of retraction, but solely and independently to abnormality of the contractile forces. As a result the contractions are inefficient and the derangement may affect the force, frequency, duration or rhythm of contractions.

Now it is exactly because we have no truly reliable and uniform means of assessing clinically the measure of the strength of the uterine contractions, and because we do not know how they are initiated and what controls them, that the parturient, in whom the contractions do not run to type, presents often a difficult problem. Several attempts have been made to calculate the uterine forces by means of instruments, in which use is made of a balloon placed in adjacent organs, the uterus, the rectum, the bladder, the vagina. In other methods of investigation, instruments are placed on the abdomen over the distended uterus.

Pain — the subjective sensation of pain — is no indication of the strength of the uterine contractions; feeble contractions may in fact cause agonising pain whereas powerful and effective contractions may not cause undue distress to the patient. The clinical methods whereby information is obtained about the efficiency of the contractions are two: (i) abdominal palpation of the uterus; (ii) judiciously repeated vaginal examinations to observe the rate at which the cervix dilates.

By placing the hand on the uterus, one can estimate the degree of hardening brought about by a contraction, as well as the duration and frequency of the contractions. Three conditions can in this way be recognised, namely: (i) the *normal* labour pains, i.e. the uterus is contracting regularly; (ii) the *irritable* uterus. In this condition it is difficult to feel the foetus; there is incomplete relaxation between the pains. "Instead of the uterus contracting normally it is maintained in a state of irritable tonicity, superimposed on which are frequent wavering spasmodic contractions which, possessing but little force, are the cause of great pain." This condition occurs mostly in neurotic women. Miles Philip has made the following observation: with normal labour contractions, the sensation of pain stops before the actual contraction; with irritable uteri the painfulness of the uterine contraction lasts longer than the palpable hardening of the uterus; (iii) the *incoordinate* uterus. The uterus is almost entirely and continuously relaxed with sharp, strong, occasional and irregular contractions. The contractions cause much pain which leads to exhaustion of the patient. There is often spasm of the cervix, and the condition is sometimes referred to as "functional cervical dystocia." It occurs in the absence of the common causes of difficult labour, and often in women who exhibit the "dystocia dystrophia syndrome".

By vaginal examination one can note the rate of dilatation of the cervix. In assessing the efficiency of the uterine

contractions from the rate of dilatation of the cervix one must exclude other factors which in themselves are the cause of slow dilatation, such as, cicatrices of the cervix and under-development of the cervix. Munro Kerr draws attention to a simple clinical test. He states: "When examining a patient vaginally during labour one often feels the os externum contracting before the fundus and before the patient appreciates the contraction; when there is obstruction, as exists in the cervix at the commencement of labour, a peristaltic wave starts from the cervix, passes to the fundus, and then down the cervix. Most of the older writers direct attention to this clinical fact".

On digital vaginal examination three conditions can be recognised: (i) during a normal labour one finds that the cervix is dilating regularly, the membranes may not have ruptured, or if ruptured there are no signs of pressure; (ii) with delay in labour due to an obstruction, one finds signs of pressure, such as oedema of the cervical lips, moulding and fixity of the head; (iii) when delay is due to incoordination, one finds little or no dilatation, the cervix is flattened out to a thin rim, and there are no signs of pressure even if the membranes have been ruptured for 48 hours. Besides the dilatation of the cervix, one should examine carefully for information about the direction and flexion of the head as can be obtained from the sutures and fontanelles.

The rate of dilatation of the cervix can only be observed by frequent vaginal examinations, but unless precautions are taken such procedure is fraught with very real dangers.

A combination of unfortunate circumstances may arise which prejudice the health of the mother and of the foetus. As there is nothing present, or nothing that can be readily detected to herald the delay which will take place during labour, the midwife and the doctor may not observe the scrupulous ritual of antisepsis or asepsis. This pitfall at once limits the choice of the obstetrician, for he will not lightly undertake to perform Caesarean Section — when this is the only way, out of such an impasse — in a case so mismanaged. The patient may refuse food and does not sleep, and in this way the energy for the stiff exercise of labour is wanting and exhaustion, insidiously but steadily, sets in.

It is important to distinguish between a labour which has all the normal features except that it is slower, and a labour which, for defects of function or structure, is delayed or protracted. The one is similar to a smooth machine that is going at a slow speed, the other to a machine which is faulty and is breaking down. In labour which is simply slow, there is a regularity about the contractions and there is good relaxation in between; the contractions are not associated with undue pain and the general condition of the mother is satisfactory; the case is therefore one of mere slowness of the stages of labour, but with steady and progressive cervical dilatation and foetal advance. In delay due to faulty mechanism, the patient may have been long in labour and the general condition of the patient shows definite changes; her expression is one of anxiety; she looks very tired and her voice is subdued; she seems to have lost tone. The tongue may be dry, and the pulse and the temperature may have gone up. These changes occasionally take place before the patient has been an unduly long time in labour.

I. ANOMALIES OF UTERINE CONTRACTIONS.

To be efficient, uterine contractions should be strong, regular and sustained. There are several factors on which this efficiency depends, namely:

1) the local condition of the uterine muscle;

2) the hormonal influence;

3) the local or peripheral neuro-muscular mechanism;

4) the control by the Central Nervous System.

1. The local condition of the uterine muscle.

The uterine contractions may be inadequate because:

(a) the muscle fibres are stretched beyond the optimum, as in over-distension from hydramnios, plural pregnancy, pendulous abdomen;

(b) the muscle fibres are quantitively deficient in bulk; thus some observers find an extremely thin uterine wall in some cases of C.S. performed for primary uterine inertia;

(c) the muscle fibres may lack in tone, as in too frequent child-bearing, or occasionally in elderly primiparae;

(d) the muscle fibres may become mechanically inefficient from fibroids and scars;

(e) the lower uterine segment may be abnormally adherent to the membranes, so that these do not separate and form the bag of waters as they should;

(f) the cervix may be functionally or organically rigid. The organic causes may be due to scars resulting from amputation of the cervix, caustics or radium applied to the cervix. The functional causes are spasmodic rigidity and constitutional rigidity. In these cases the cervix does not dilate in spite of strong uterine contractions. By giving an anaesthetic, one can distinguish between "functional" spasm of the cervix and the "fibrous rigid cervix"; anaesthesia relaxes the functional spasm but not the true rigid cervix. One should not hesitate to explore the size of the os and its softness under anaesthesia.

2. The hormonal influence.

The contractions of the uterus are intimately influenced by hormones. The oxytocic component of the posterior pituitary hormones, and the oestrogens derived from the ovaries and the placenta increase the tone and the excitability of the uterine muscle, whereas the corpus luteum, the adrenals, and the anterior pituitary are considered to have an inhibitory effect. An imbalance of these various hormones is now thought to be the cause of sluggishness of the pains in the dystocia dystrophia syndrome.

3. The local or peripheral neuro-muscular mechanism.

The uterus can contract regularly and rhythmically even when severed from any central nervous influences. This phenomenon is achieved through the nervous cell structures probably scattered in the uterus itself and in the surrounding tissues, such as the paracervical ganglia on either side of the cervix. Afferent impulses arising from these nerve cell-stations, through pressure by the presenting and descending part into the lower segment and later in the vagina, provoke and reinforce uterine contractions. Anything which prevents the presenting part from pressing on the cervical ganglia will prolong labour. This may occur with: (i) contracted pelvis, android pelvis; (ii) large head; (iii) incomplete flexion of the head; (iv) malpresentation: occipito-posterior, breech, shoulder, face; (v) premature rupture of the membranes, in which case the dilating power is lost.

The neuro-muscular mechanism is also responsible for the coordination of uterine contractions, whereby the upper segment contracts while the lower dilates. If the work of these segments is imperfectly coordinated, progress of labour is delayed. Thus, in spite of forceful contractions of the upper segment, the cervix fails to dilate and there is severe colicky pain. Spasmodic rigidity of the cervix may also be due to impairment of the peripheral mechanism.

4. The Central Nervous Control.

But although the uterine contractions are not necessarily dependent on the

C.N.S. they are subject to important modification by this system. The pathways for this influence are: (i) centres in the spinal cord to uterus—thus a loaded rectum or a full bladder send inhibiting impulses which are readily corrected by emptying these viscera; (ii) brain to cord and thence to uterus, i.e. the highest centres as well as the hypothalamus initiate this influence thus nervousness, fear, dread, apprehensiveness slow down uterine contractions. Severe suffering delays contractions, and morphia, by allaying pain, may expedite them. Fear of an operation may hasten them.

II. ANOMALIES OF THE ABDOMINAL MUSCLES.

When the auxiliary efforts of the abdominal muscles are deficient, the second stage may be unduly prolonged. This may occur with:

1) pendulous abdomen — the abdominal muscles have only a weak hold on the uterus;

2) cardiac and pulmonary diseases with dyspnoea;

3) hernias;

4) tumours in the abdomen, such as fibroids, cysts, full bladder;

5) deep coma;

6) hypersensitive women do not bear down properly because they are afraid of pains;

7) the woman may not know how to make good use of the abdominal muscles, especially if she contracts spasmodically the muscles of the pelvic floor;

8) the woman may be too tired to bear down in the second stage, if she has expended her energy in fruitless bearing down efforts in the first stage;

9) the woman may have poorly developed abdominal muscles.

It is a profitable exercise to divide the causes of delay with reference to the stages of labour and to the rupture of the membranes.

In the *first stage,* labour may be prolonged because of:

(i) obvious causes, e.g. overdistension of the bowel or bladder; overdistension of the uterus from hydramnios or plural pregnancy; lack of tone of uterine muscles from frequent child bearing;

(ii) obscure causes, e.g. hormonal inhibiting influences, faulty innervation.

In the *second stage,* delay may be due to:

(i) faults in uterine contractions—the same conditions that impair the uterine pains in the first stage may cause faulty contractions in the second stage, e.g. overdistended bladder;

(ii) faults in the auxiliary or bearing down forces which are produced by reflexes induced by pressure of the presenting part on the pelvic floor — these reflexes may therefore be inhibited by: malposition or malattitude of the child; nervousness on part of the patient; weakness of the abdominal muscles themselves.

Before rupture of the membranes, delay is due either to weakness or to an erratic action of the contractions. *After rupture* of the membranes, labour is prolonged when the contractions are abnormally weak and infrequent, and when there is tonic contraction of the uterus, either general or local. What actually causes these abnormalities has been discussed already.

RISKS OF DELAY IN LABOUR

There are little risks to mother and child as long as the bag of waters is intact. Those cases where there is simply a slowing down of labour pains, carry no serious risk, except some distress to the patient and anxiety to the attendant, and natural termination is the most frequent outcome. The difficulty is to know when to desist, for premature intervention in these cases exposes the mother and the foetus to real danger. However, while the

temptation should be resisted, the patient should be continually watched. It is this factor of uncertainty which makes the management of these cases difficult.

In the more serious cases of delay, the risk is in proportion to the time that has lapsed after the membranes have ruptured.

The dangers to the foetus are: 1) asphyxia, from deficient circulation in the placenta due to the uterus having retracted on the placental site; 2) infection in utero, from bacteria invading the uterine cavity from the vagina and even if the child is born alive it may succumb shortly after birth, from the effects of the asphyxia or infection suffered in utero; 3) injury, from operative interference.

The dangers to the mother are: 1) infection, which most often occurs from vaginal bacteria invading directly the uterine cavity, or rarely from the foetus when this has been long dead and its tissues invaded by gas-forming bacteria; sepsis is favoured by too long waiting, too many internal examinations and manipulations, and injuries inflicted from operative interference; 2) exhaustion — both physical and mental — comes on after labour has lasted many days, may make the condition of the mother very grave and even desperate.

Interference may be forced upon the obstetrician at a very critical time, which he would have avoided were he not aware that the patient would die undelivered from sheer exhaustion. It is therefore incumbent on the attendant, that in patients whose labour is progressing very slowly after rupture of the membranes, "the urine should be examined from time to time for acetone, the pulse and the blood pressure taken, and the general appearance and sensations of the patient noted".

TREATMENT

The first thing to do in a case of delay in labour, is to carry out a thorough investigation.

If a gross abnormality is present — e.g. evident disproportion between the head and the pelvis — Caesarean section should of course be carried out before exhaustion or infection supervene.

If no gross abnormalities are detected the treatment is primarily expectant, but measures should be taken to make the patient rise to her ordeal. The measures to be adopted can be discussed under the following heads:

1. Sedation.
2. Ensuring sufficient intake of food and fluid.
3. Correcting any abnormalities that may delay labour.
4. Use of oxytocic drugs.
5. Operative interference.

Sedative drugs. Adequate sedation is a very important measure. It keeps off exhaustion from pain and lack of sleep.

Sedative drugs are indicated in circumstances of:

1) severe pain with inefficient contractions;

2) excessive fear and apprehension;

3) prolonged labour without at least some hours of restful sleep.

Strong sedative drugs should not be used in the second stage, and morphia is definitely contraindicated. But in the other circumstances mentioned, morphine has a most beneficial effect. When pain is extreme and contractions inefficient, it will allow the patient to get some rest, it quietens the uterus and the contractions appear to become more coordinated. After a few hours, the cervix will be found to be dilating well and delay is overcome. By abolishing dread and apprehension it may actually accelerate labour; in those cases where the parturient has been long in labour without getting sufficient sleep, it will probably stop the pain entirely, but at the same time it gives the patient

enough rest, so that the contractions start with renewed vigour. One should aim to provide at least 8 hours rest in 24 hours.

Morphine gr. ¼ may be administered alone or with hyoscine gr. 1/200, and when the effects begin to diminish chloral hydrate gr. 30 in 2 ozs of water may be given per rectum.

In resistant cases — where in spite of rest and further uterine contractions there is still no progress — paraldehyde 6-8 drs in olive oil or saline may be given 6-12 hours after the administration of the morphia.

Pethidine has been extensively employed with favourable results.

Food. Where labour is protracted for several days, steps should be taken to avoid starvation and dehydration. With tact and encouragement the patient should be made to have sufficient food and fluid especially as the patient often does not ask for any. Small carbohydrate meals should be given and frequent fruit juices with sugar. When the patient is vomiting and is unable to take anything by mouth, glucose solution should be given intravenously.

Correction of abnormalites. A loaded rectum or a full bladder should be voided, because very often, an enema or the use of the catheter are followed by an increase in the frequency and strength of the uterine contractions. Where the breech presents and there is no pelvic contraction, pulling down a leg will induce the half breech to press tightly on the lower segment and excite vigorous uterine contractions. If the vertex presents and the membranes have ruptured, a tight abdominal binder will also press the head against the lower segment and induce contractions. When the membranes are too tough and project through a fully dilated cervix, they should be punctured. If the membranes are abnormally adherent — i.e. they do not project through a fully dilated cervix — the finger should be passed through the internal os and swept round between the uterine wall and the membranes. A pendulous belly should be corrected with a binder. If hydramnios is the cause of the weak pains, the membranes should be ruptured, but only after the cervix is two-thirds dilated. Uterine massage, or letting the patient change her position or walk about, may affect an improvement in the contractions. The patient should be instructed as to the best way to bear down. The exaggerated lithotomy position is often helpful. When the head is low down, a modified Ritgen manoeuvre, episiotomy, or application of the forceps may be necessary.

Oxytocic drugs. These should be used only in cases of weak and infrequent pains, and never when the contractions though feeble and infrequent are none the less painful.

Oestrogens do not initiate uterine contractions, but are occasionally successful in increasing the sensitivity of the uterus to the natural mechanism. In selected cases Dimenformon, 20,000 units hourly for six doses is sometimes successful.

Acetylcholine, 3 grs 2 hrly, on the analogy of its stimulating effect on unstriped muscle, has been given in cases of inertia, but with doubtful success. It is supposed to stimulate the longitudinal fibres through the sympathetic nerves.

Small doses of quinine, e.g. a single dose of 3 grs of quinine sulphate or bihydrochloride by mouth, often succeed in increasing the strength of the uterine contractions and thus accelerating labour. Heavy or repeated doses of quinine may be dangerous to the foetus, as they may give rise to asphyxia owing to muscular spasm with incomplete relaxation between pains. It is also considered to be injurious to the auditory nerve of the foetus. Of oxytocic drugs which act during labour, posterior pituitary extract is certainly the most powerful but it has great limitations in the treatment of uterine inertia. It may provoke contrac-

tions so violent as rupture the uterus. It may also cause laceration of the cervix and perineum, shock, convulsions, or death of the child from asphyxia or cerebral haemorrhage. It should never be given unless the cervix is fully dilated and the head low down in the vagina. Any obstruction is an absolute contra-indication to its use. It should not be administered in cases where prolongation of labour is due to incoordination, rather than to weakness or infrequency of the pains, for at the least it will increase the distress to the patient. It is only indicated when a normal labour has come to standstill in the late phases of the second stage, with the head low down in the vagina. It should be given in small doses of 2 units.

Operative interference. As has already been stressed, the attendant is often confronted with this dilemma. The majority of cases of prolonged labour terminate spontaneously, but if labour is too long delayed the condition of the mother may become desperate. Should he perform injury by dilating the cervix and delivering, or should be wait longer and allow the patient to get more tired? The turning point in the mother's condition is most sudden, and definite rules cannot be laid down about the best time to interfere. It is unlikely however, that a safe or spontaneous delivery will occur when: 1) the pulse rate rises above 100; 2) there is severe mental anguish, and 3) locally the membranes have long been ruptured, dilatation of the cervix has come to a standstill and the oedema of the lips is increasing.

The nature of the interference depends, in addition to other important factors, on the amount of dilatation of the cervix.

According to A. Bourne, one should start worrying when membranes have been ruptured for 4 or 6 hours. In some cases, it will be found that in spite of adequate sedation there has not been sufficient progress, even 24 hours after the membranes have been ruptured; the os is probably half dilated and there is a little caput. In these cases, one is guided by the state of the mother (i.e. whether exhaustion is present or not) and by the state of the baby (i.e. whether the heart beat is beginning to get slower or not). In these cases one may give an anaesthetic and try and dilate the cervix; if the head is anterior and well flexed, forceps may be applied and the cervical rim is then pushed over the head and the child extracted. Cervical laceration is unavoidable. In a few cases there is no progress whatsoever. The cervix is found to be rigid, and the os will not dilate even after 3 or 4 days of labour. If in these cases, the occiput is placed anteriorly and the head flexed, one may perform Duhrssen's incision and apply forceps. The other alternative is a lower segment Caesarean section. This is a risk in spite of penicillin and sulphathiazol; moreover the child not infrequently does not survive long.

If in these cases, the occiput is placed posteriorly, or there is some degree of contraction, or there is some organic condition, the lower segment Caesarean section is indicated.

Cases of functional delay without signs of exhaustion should be left alone.

THE CONCEPT OF MENTAL DISORDER IN MALTESE TRADITIONAL LORE

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Introduction.

THE study of popular beliefs and traditions throws an illuminating light on the mental organisation of our ancestors and of the unlettered section of contemporary society. It reveals how the primitive mind tries to explain the unfamiliar in conformity with mankind's budding experiences of a puzzling and often hostile world. Much of this lore appears incomprehensible and nonsensical to us to-day, but its meaninglessness, like the strangeness of schizophrenic thinking, will disappear if its underlying motive can be discovered. The interpretation of folklore can be a difficult and sometimes an impossible task, because the traditions that have reached us may represent the end-products of the imposition of several cultural influences which cannot now be differentiated. This is especially so in the case of a people like the Maltese, whose earlier modes of thinking have become inextricably mixed, through the centuries, with the beliefs and customs of the various possessors of these Islands.

Among the themes of folklore, that of insanity is one of the most intriguing for, like the problems of death and the supernatural, it has puzzled man since the earliest days of civilization. It has often terrified him, but certain aspects of it have also amused him as we can see from the many tales which have grown round the figure of some feebleminded character like "Gahan". Whatever the form of emotion aroused in him, the theme of insanity has never ceased to appeal to man's imagination and to tax his capacity for speculation.

The beliefs, legends and practices that have been evolved through countless years by our ancestors in their attempt to explain and to cure mental disorder are gradually disappearing, and it is just as well that they should be discarded in favour of the present more efficient theories and remedies at our disposal. We are not justified however, in despising and ignoring the medical lore of our relatively uncultured ancestors. Traditional medical lore is important historically because much of what are to-day untenable popular beliefs, represent the accepted teaching of medical men of the past. It is also valuable from the sociological point of view because, in spite of its decadent notions, it continues to exert a great influence on contemporary popular thought and constitutes, therefore, a potent force to be reckoned with in our efforts to enlighten the masses in mental health matters.

The aim of this paper is to record what the writer has managed to collect of past and present Maltese lore on the subject of insanity and mental deficiency. It would, perhaps, be as well to point out from the outset that the material is not abundant. Much may have been lost through forgetfulness and much may remain to be discovered. Apart from all this, however, the paucity of the material may also be due to the fact that cases of mental disorder were not so numerous in the past as they are now.

The bulk of the material contained in this paper may be conveniently considered under two headings:— (i) lore that regards mental disorder as a manifestation of supernatural agencies; (ii) lore which attempts to explain and to treat

mental illness on more or less rational lines.

The Supernatural Approach.

The Maltese word for insanity is "ġenn". It is derived from the Arabic "ghafrit ġinn" which means "a wicked spirit" (1). Vassalli connects the word "ġenn" with the Latin "genius" and renders it in Latin as "spiritibus obsessio" and "insania, insanitas, furor, mania"(2). Obviously our word "ġenn" conveys the idea that insanity is caused through the possession of an individual by an evil spirit. Apart from "ġenn" we also have the phrase "ferh ta' ġenn" (literally, "the offspring of an evil spirit") which denotes either simple loss of control, — a state of frenzy which does not amount to insanity (compare "losing one's head"), — or a sudden outburst of excitement with or without violence and which is actually a form of mental disorder known to psychiatrists as "mania".

The idea of possession underlies certain remedies prescribed for the treatment of mental illness as can be easily ascertained from the following practices. One form of treatment in the case of a "fright" consists in the reading of a portion of the Gospel of St. John over the head of the person who has had the fright by the Papas of the Greek Church. This custom is mentioned in Dusina's "Acta Visitae Apostolicae" of 1575 (3). The writer recalls that up to 20 years ago, it was the custom in Senglea to take mischievious children to a priest for reading over their heads a portion of the gospel in order to allay their restless temper (4). One also frequently hears harassed mothers referring to their problem-child as being "indemunjat" (possessed by the devil).

Belief in demoniacal possession was almost universal in the early middle ages, while still earlier cases of possession by a malign spirit are to be found in ancient Hebrew literature (5). It is not surprising that this belief should be found among us. It is clear that the reading of the gospel in the cases cited above is a form of exorcism against the presence of evil spirits in the child. It is an instance of the employment of a supernatural power of a good kind to neutralise a supernatural force of an evil nature — a form of treatment that is widely used by the primitive medicine man (6). The belief in the value of exorcism for the treatment of mental disorder is to be found not only among uneducated Maltese, but occasionally even among the more cultured section of the population. The writer recalls the case of an old priest who was under his treatment for depression some years ago and who had gone to a high church dignitary to ask him to exorcise the evil spirit out of his body. It is not uncommon, also, to come across patients suffering from obsessions and compulsions of an obscene character, who are given to understand by well-meaning friends that their thoughts and actions are the attempts of the devil to damn their souls. In fact these patients complain of "tentazzjonijiet" ("temptations") when describing their obsessional thoughts and compulsive acts.

In the past, more energetic but less humane means than exorcisms were adopted to cast out the evil spirits. As late as the first quarter of the last century, insane persons who were detained at the Ospizio of Floriana were subjected to severe beatings, in the belief that they were possessed by the devil (7). There is a hint that even up to 1863 insanity was still regarded by certain sections of the community as a form of possession. In fact a statue of St. Vincent Ferreri (who was renowned for casting out devils) was donated in that year to the patients of the mental hospital at Attard.

Even to-day we still find the notion of possession appearing as a delusion in patients suffering from depression with a religious colouring. Such patients often express the belief that they harbour the devil inside their bodies, and they ascribe

their feelings of despondency and melancholy to his presence inside them (8).

Closely related to the belief in possession by evil spirits, is the belief in the so called "evil eye" for the warding and removal of which, various practices and charms have been devised (9). The conviction that certain individuals are endowed with the power of causing an injury or an illness by just looking at the person whom they wish to harm is widespread in Malta. This belief is sometimes met with in certain forms of mental disorder when it may be difficult at the initial stage of the illness, to determine whether it should be considered as a "normal false belief" or as a delusional formation. In not a few cases the influence of the "evil eye" is adduced by the uneducated patient as the cause of his mental trouble — a "theory" that may be upheld by the patient's relatives as the most probable explanation of the patient's unexpected illness. A particular person may be indicated as the individual responsible for casting the "evil eye" on the patient; or else no specific personal source is given, when the "evil eye" is conceived as being a malign influence permeating a certain locality. Thus a patient, who believed that her mental distress was due to the influence of an "evil eye", was advised by a friend to have the house blessed in order to cast out the "evil eye". A more radical remedy against this sort of influence, is for the whole family to move out of the house reputed to harbour the "evil eye".

Also commonly encountered is the belief that a patient's mental illness is the result of a spell cast upon him by an evil wisher.

Epilepsy.

Epilepsy is popularly known as "mard tal-qamar" (literally "the moony sickness"), or more euphemistically as "marda tal-ħass-ħażin" ("to suffer from fits") The name "tal-qamar" is derived from the belief held in the past that the moon and the planets could determine the occurrence of fits (10) — a belief that is still current in Malta even among educated persons.

This disease is looked upon with feelings of dread and awe by the uneducated section of the community, who, when they suffer from it, do their utmost to conceal its existence from their friends and neighbours. Epilepsy has obtained such a hold upon popular imagination, that some people, especially country folk, are even afraid of mentioning it and when they cannot avoid referring to it they make use of the phrase "barra min fuqna" ("God protect us") — an invocation that is also commonly uttered when mention is made of such other dreaded diseases as plague, cholera, leprosy,etc . Perhaps the dramatic signs and symptoms of this disorder — the sudden convulsion, the fall to the ground, the contortion of the facial muscles and the bluish discolouration of the face, the frothing at the mouth and the final unconsciousess — and the fact that up to very recent times it had defied all remedies, are responsible for the popular prejudice against the epileptic. This prejudice may also have arisen from the belief, commonly held in Europe in the middle ages, that epilepsy, like plague and cholera, was a contagious disease. It is known that an isolation hospital for epileptics was founded at Rufach in Upper Alsace in 1486 (11). It is highly probable, too, that our ancestors held the belief that the epileptic was a man possessed by evil spirits — an idea that was very common centuries ago, not only among laymen, but also among those who practised medicine. To this day "qammari" (i.e. epileptic) is considered to be a highly offensive and insulting epithet.

From Qala (Gozo) comes this fanciful remedy for epilepsy. A tortoise is killed and its blood is drunk by the person who suffers from fits. In order that the cure may be efficacious, however, the blood must be drunk immediately after the first fit appears (12).

Somnambulism.

A superstitious belief that lingered up to the end of last century suggests that it was an attempt on the part of our ancestors to account for the occurrence of somnambulistic phenomena. It was held that persons who were born on Christmas eve were transformed once a year on this day into a ghost (called "gawgaw") while they were asleep. Thus changed they were compelled to wander about frightening people with their groanings. Towards dawn they returned home in an exhausted condition. By the time they woke up in the morning they had reassumed their human form but they were quite unaware of their nocturnal peregrinations. It was thought that this transformation was a punishment from God imposed upon those who were born on the same day as Jesus Christ, the explanation being that the Lord did not wish anyone to be born on the same day as his Son.

The remedy against this transformation consisted in inducing the sufferer to sit up all night and to count the holes of a sieve from eleven o'clock at night to the following Christmas morning (13).

Vassalli, after remarking in his dictionary (12), that the word "gawgaw" is derived from the Syrian "hagogo" (ghost) confesses that he is unable to explain how this legend originated.

Most probably the tale springs from two distinct levels — the idea of the transformation occuring on Christmas eve being a relatively recent graft on to an older source dating from pre-Christian times. That this may be so is suggested by the inconsistent way of reasoning between its two levels. In fact, the transformation is looked upon as being an indication of divine wrath and displeasure, which is an instance of the old belief that illness is sent by God. The logical inference of such a conception would be that, since illness comes from God, healing must also come from Him or through Him. In the "gawgaw" tale, however, the cure that is prescribed does not follow this religious argument but appears to be based on the rational principle that in order to prevent the transformation from taking place, the individual must be dissuaded from falling asleep — hence the endless task of counting the holes in a sieve. It is significant that the transformation was regarded as a manifestation brought about by or during sleep, and that if the latter could be avoided, the transformation did not occur.

Whatever its origin and development, it is evident that somnambulistic phenomena form the basis of the "gawgaw" superstition. The wandering away from home during sleep, the return in an exhausted condition in the morning and the subsequent amnesia for the night events are typical features of somnambulism. The alleged transformation of the sleeper into a ghost is the popular way of denoting the psychogenic dissociation or splitting which is responsible for the somnambulistic state. The execution of complicated acts, the presence of terror reactions or other dramatic behaviour occuring during sleep have always baffled and terrified the lay mind. It is not surprising that, in the past an explanation in supernatural terms should be sought for phenomena occuring during sleep at a time when the underlying mental mechanisms with which we are now familiar were yet undreamt of.

The Rational Approach.

The various concepts by which the popular mind tries to explain the occurrence of mental disorder on rational lines may be considered under these headings:—

I. PSEUDO-PHYSIOLOGICAL CONCEPTS.

(1) Suppression of menstruation is believed to cause insanity. The idea is current that menstrual blood is "bad blood" and if it is not shed when the

period is due, it rises to the head and produces madness. Hence the expression "telgħalha d-demm għar-rasa" ("the blood has gone up to her head"). Perhaps this idea originated from the subjective sensation of "flushes of heat" in the head, of which depressed and anxious patients often complain.

Insanity is held to occur also if a woman washes her hair during her menses.

(2) The action of alcohol on the brain is explained on very similar lines. It is believed that wine and spirits heat the blood and cause it to rush to the head thus inducing a fit of madness.

(3) Not only an excessive flow of blood to the head but also a diminished supply of blood to this part of the body is held responsible for the occurrence of mental disorder ("nuqqas ta' demm f'rasi").

(4) Masturbation in males is commonly regarded as being a cause of insanity. This belief is held not only by the illiterate section of the community but also, unfortunately, by persons who should know better, such as teachers and priests. This is not surprising in view of the fact that until quite recently even medical men listed masturbation among the aetiological factors of mental disorder.

(5) Mothers ascribe the appearance of epilepsy during adolescence to the natural processes of bodily growth which occurs at this time of life ("l-iżvilupp") and they expect that the disease will disappear when the boy or girl reaches adult age.

(6) Some fancy that certain physical agencies have some special influence on the brain. I remember, among others, the case of a stoker who was suffering from depression and whose wife attributed his disorder to the action of fire on his brain — "the fire has dried his brain" ("in-nar xoroblu u nixxiflu moħħu").

(7) "Fjakkizza" and "debbulizza" ("undernourishment") as a cause of insanity, is very deeply ingrained in the popular mind — hence the treatment for all forms of mental illness consisting in the daily consumption of large amounts of milk, eggs and other "nourishing" foodstuffs ("sustanżi") to strengthen the supposedly weakened brain ("moħħ fjakk").

Lack of fresh air ("nuqqas ta' arja") is also thought to be causative of mental illness.

(8) Overwork is often adduced as a cause of insanity in the case of intellectual workers. Hard manual work, however, does not seem to be regarded as being conducive to mental ill health.

II. MECHANISTIC CONCEPTS.

Certain expressions in our everyday language denote a mechanistic conception of cerebral and mental processes. Thus "moħħu żurżieqa" (applied to a person with a bad memory) implies the idea of some object which, because of its sloping sides is incapable of supporting any thing placed upon it. "Moħħu ma jerfax" (applied to a person who is slow to learn) reminds one of a structure that is so weak that it lacks the necessary strength to support an object. "Moħħu ħafif" has a similar connotation. The dynamic view is obvious in the term "għandu barma nieqsa" (literally "to lack a twist") and "għandu rota nieqsa" (literally "to have a wheel missing") used to describe an insane person. The phrase "il-menti tieghu waqfet" ("his mind has stopped working") is interesting, because we find in it a reference to mind and not to brain as in other expressions. But here, too, the conception of mind is not that of an abstract entity but of a machine — some sort of clockwork that "stops working" when it goes wrong.

III. PSEUDO-PSYCHOLOGICAL CONCEPTS.

(1) It is a current belief that a fright may cause insanity and it is not uncommon to hear mothers, who have borne a

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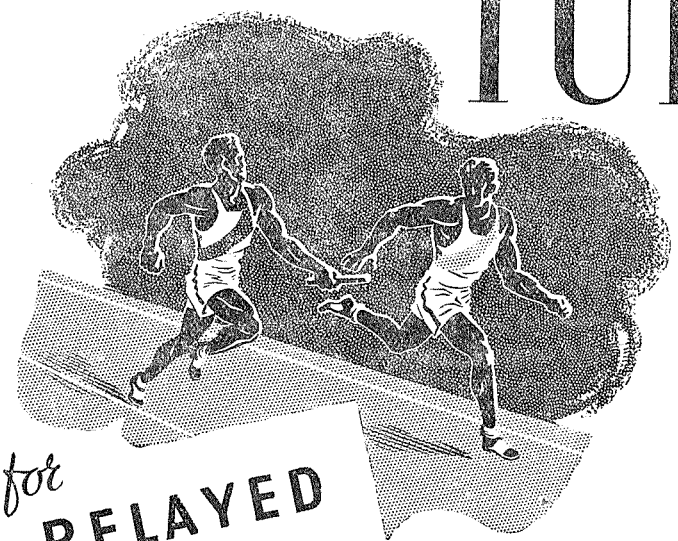

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mentally deficient baby, to ascribe the mental condition of their offspring to a fright which they had experienced during their pregnancy ("qata' fil-ġuf"). A person, according to popular lore, can be frightened into madness if he is exposed to situations which are likely to cause sudden and unexpected fearful emotions, such as throwing cold water on the face of a sleeping person.

Various remedies to ward off the effects of a fright have come down to us:—

(a) A baby who has had a fright is dipped into a bath containing some flowers procured from the Sepulchre on Maundy Thursday. The dipping must be carried out on Easter Sunday.

(b) A puppy is killed and boiled in water. The broth is then given to the person, upset by a fright, to drink. The boiled puppy is then thrown into the plate while the patient is not on his guard in such a way as to startle him (15).

(c) "Sewwilu flixkun" (literally "to prepare a bottle", i.e., a mixture) consists in the concoction of a potion which when drunk is supposed to prevent the deleterious effects of a fright. Up to some years ago there was an old woman at Birkirkara who enjoyed a wide reputation among the country folk for the efficaciousness of her mixture, the ingredients of which she would not divulge (16).

(d) The advice is often proffered to urinate immediately after one has had a fright. Perhaps the idea is to get rid of any noxious substances that are imagined to have been produced in the body as the result of the fright. In fact, when one has had a great fright he is spoken of as having passed blood in his urine.

(2) The occurrence of the so-called "lucid interval" and of apparent remissions in mental disorder has long been noted by Maltese folk. They tend to mistrust persons who have had an attack of mental disorder because they have an unduly pessimistic idea as to the final outcome of a mental illness. In fact, popular wisdom warns us that "il-miġnun dejjem miġnun, u meta juri li hu f'saħħet għaqlu ftakar filli jista' jkun" ("once mad always mad; even when a madman appears sane, remember that he may not really be so").

Mental Deficiency.

Mental deficiency appears in our folklore in the character of "Ġaħan"—the good humoured, mischievious simpleton. Numerous stories have been spun round this character. Here are two illustrative examples:—

(a) Ġaħan's mother fell ill and her doctor asked her to preserve a sample of urine for examination. When the doctor called the following day, Ġaħan presented him with a chamber-pot full of urine. The doctor expressed surprise at the great amount of urine passed by his patient, but Ġaħan promptly reassured him, saying: "Besides my mother's, the chamber-pot contains also my urine, but my portion is on top" (17).

(b) On one occasion Ġaħan's mother went to church and left him alone at home. Before going away she told him to close the door when he left the house. He literally obeyed his mother's injunction—"iġbed il-bieb warajk" ("pull the door behind you") — and having dislodged the door off its hinges, he dragged it along to church with him (18).

Etymological and historical arguments have been put forward (19) to show that the stories, as well as the name of Ġaħan are of Semitic origin, while Magri (20) argues that the tales of Ġaħan were brought by the Phoenicians to Malta and the Barbary Coast whence they were taken to Sicily by the Arabs. If Magri's theory is accepted, we have to conclude that the Phoenicians, who came to Malta many centuries before the Christian era, were well acquainted with the lighter side of intellectual backwardness.

The expression "donnok Ġaħan" is still heard to-day and means "you act like a fool". Another saying, with the same connotation, but which does not seem to be current now, is "donnok Canu". According to Bonelli, Canu was a simpleton who, during the siege of Malta of 1565, threw a pot containing burning material on his own comrades instead of on the enemy. The same author reproduces another tale centering round the stupid behaviour of a wife and a group of fishermen whose grade of intelligence must have been very low indeed (21).

As to the causation of mental deficiency, I have already mentioned that a pregnant woman who has experienced a fright is supposed to give birth to a mental defective. It is also popularly believed that any intense emotion, such as joy or grief, in a pregnant woman may cause imbecility in the offspring, while some forms of emotional upset during coitus may also result, according to folklore, in the birth of a mentally deficient baby.

Some of the gross manifestations of intellectual subnormality have impressed the popular mind, which has recorded its observations in the form of proverbs and aphorisms. The inability of the weak-minded person to count figures forms the basis of "mhux iblah, jaf jgħodd salgħaxra" (literally—"he isn't a fool, he can count up to ten"); the not infrequent association of imbecility and idiocy with physical stigmata has given rise to the saying "mhux iblah daqs kemm hu ikrah" ("he isn't as big a fool as he is ugly"); while the lack of criticism and judgement shown by the mental defective is pithily summed up in "l-iblah taqlalu għajnu, jiftaħ" ("pluck out the eye of a fool and he will rejoice over it").

Senility.

In our days, when the management of senility has been recognised as being mainly a psychiatric problem, it is only natural to ask ourselves whether there is any indication in our folklore as to how old people fared in the remote past. We have no direct evidence pointing to the fate of demented seniles, but some insight into the ideas of our ancestors regarding the disposal of old people may be gained from a consideration of the "Għaġuża" tradition and from a tale reported by Bonelli (22). From this story, we learn that there may have been a time when it was the accepted custom to dispose of old decrepit folk by walling them up alive into caverns and leaving them there to die.

The "Għaġuża" was the oldest person living in the parish (so the legend runs) and she was killed at noon on a Thursday in the middle of lent by being hurled down from the steeple of the parish church or of a convent (23) or by breaking her body into two (hence the saying "l-għaġuża f'nofs ir-randan tinqasam") (24). The "Għaġuża", apart from being old, also had the reputation of being a wicked and deceitful woman, whence the phrase "għaġuża ħażina" and the saying "ma tridx temmen l'għaġuża" recorded by De Soldanis in his dictionary (25). This author suggests that this legend originated from the Roman custom, by which old people holding administrative offices were disposed of by being thrown from a bridge into the waters below. We do not know whether similar customs were ever established in Malta. It is not improbable, also, that the "għaġuża" legend is a survival from the days when old crones were accused of witchcraft and condemned to die a brutal death on this score.

(1) Cremona, A. — "Some myths and beliefs in Maltese folklore" in "Melita", Vol. III, page iii; and "Race, Language and Myth" in "Melita", Vol. I, page 394.

(2) Vassalli, M. A. — Ktyb yl klym Malti — 1796.

(3) Quoted by Mr. J. Cassar Pullicino in "An Introduction to Maltese Folklore", 1947.
(4) See also A. Cremona's "Race, Language and Myth" already cited.
(5) Holmes, G. — "The Evolution of Clinical Medicine", in "British Medical Journal" of 6th July, 1946. See also the case of King Saul in the Old Testament.
(6) Marett, R.A. — "Psychology and Folklore", 1920.
(7) Cassar, P. — "The Institutional Treatment of the Insane in Malta", 1949.
(8) Our ancestors also believed in the demoniacal possession of animals, as the custom of blessing animals on St. Anthony's day appears to show. We read that the devil used to assume the form of a beast when he tried to tempt St. Anthony to fall into sin. See Rev. G. Farrugia's — "Id-drawwiet tal-Maltin", Book 85 of "Moghdia taż-żmien", 1909, pages 10 to 11.
(9) Busuttil, V. — "Holiday Customs in Malta", 1894; and J. Cassar Pullicino, op.cit.
(10) Holmes, G. — op.cit.
(11) "Epilepsy through the ages" in "Therapeutic Notes" of September, 1940.
(12) Told to me by Mr. J. Cassar Pullicino on the 13th September, 1949. He got this information from an old peasant of Qala.
(13) Busuttil, V. — op.cit.
(14) Vassalli, M.A. — op.cit.
(15) Busuttil, V. — op.cit.
(16) Told to me by Dr. J. Pisani in December, 1949.
(17) Bonelli, L. — "Saggi del folklore dell'isola di Malta", 1895.
(18) Cassar Pullicino, J. — op. cit.
(19) Cassar Pullicino, J. — op.cit.
(20) Magri, F. — "Ħrejjef Missirietna", Vol. II, Page 20, 1902.
(21) Bonelli, L. — op.cit.
(22) Bonelli, L. — op.cit.
(23) Busuttil, V. — op.cit.
(24) De Soldanis — Mss. 143, Royal Malta Library.
(25) De Soldanis — op.cit.

We acknowledge receipt of the following Journals; we apologise for any omissions :

"The British Medical Students' Journal."
"Melita Theologica".
"British Medical Journal".
"The Practitioner".

Lymphadenoma Of The Spine

A CASE REPORT

F. G. CALLUS M.D., D.M.R. (Lond.).

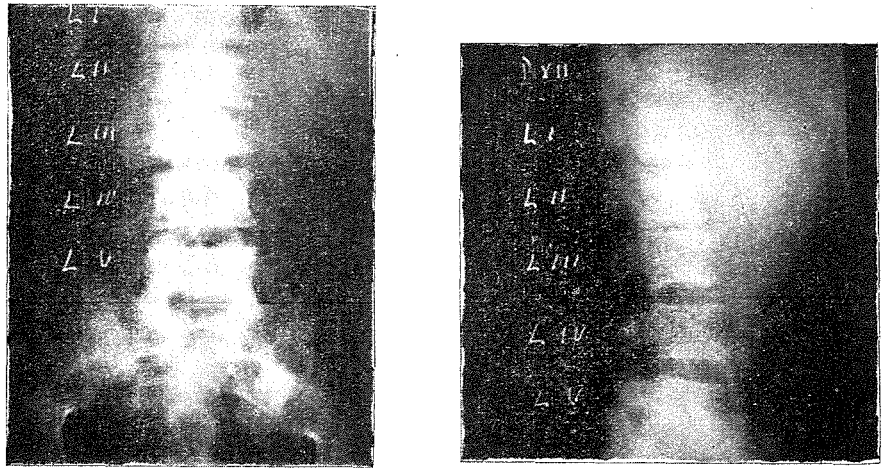
Junior Radiologist, Central Hospital, Malta.

P.S. aged 28, was referred in August 1949, to the Radiological Department of the Central Hospital for treatment by X-rays. Clinically this patient presented the picture of a fully-established Hodgkin's with painless discrete swelling of the glands in both cervical regions both axillae and groins, and moderate enlargement of the spleen. Patient looked ill, was pale and complained of lassitude. He gave a history of pain in the low back radiating forwards to the umbelicus (girdle pain), occasionally downwards to both loins with little or no intervals of freedom for the previous eighteen months, followed, three months ago, by progressive swelling of most of the accessible glands. He had no previous illnesses and denied any history of trauma. His blood count at this stage showed a diminution of the red cell count (R.B.Cs=3,000,000 per m/m) and a slight increase in the white cell count, about 15,000: there was no eosinophilia.

The persistence of the pain at the back called for immediate röentgenological investigations. An X-ray of the lumbar spine was performed and definite changes were found in the first and second lumbar vertebrae. Both vertebral bodies showed irregular areas of rarification with aneurysmal-like destruction of the anterior margins with a small quantity of amorphous calcium deposit along the antero-superior tips of the vertebral bodies. The first vertebra showed some evidence of collapse. The inter-vertebral disc space was not altered, although on account of the list of the first lumbar it appeared to be reduced. There was some loss of the normal lumbar lordosis, but no kyphus was present and the spinal canal did not appear to be involved.

There are no pathognomonic X-ray signs of Hodgkin's involvement of the spine. The above findings, though strongly suggestive, are not diagnostic: the diagnosis of lymphadenomatous deposits in the vertebra cannot be made from the X-ray film alone. If the case were examined earlier in the course of the disease, that is, when the patient complained only of pain in the back and before the condition became manifest the diagnosis of lymphadenoma of the spine would have been very difficult to arrive at, if at all. The X-ray findings may take various forms — from a simple bone rarification or an increase in density, to a purely destructive process with collapse. The bony involvement is always heralded by pain.

There is only one feature which appears to be constant in all forms of Hodgkin's of the spine, and that is the preservation of the disc. This single feature — the integrity of the inter-vertebral disc — helps us to distinguish lymphadenoma of the spine from tuberculous spondylitis in which the disc will undergo destructive changes sooner or later and in some cases may completely disappear. In the initial stages, however, the two conditions may bear a close resemblance. Blount published a case which had been treated as Pott's disease of the dorsal spine for four months and which afterwards proved to be Hodgkin's disease. The involved vertebrae later showed collapse, but the disc remained intact.



Showing irregular areas of rarefaction with aneurysmal-like destruction of the anterior margins and collapse of the first lumbar vertebra. Note the integrity of the inter-vertebral disc space.

On the X-ray film alone the appearances of lymphadenomatous deposits in the vertebral bodies may be indistinguishable from carcinomatous secondaries especially if these are of the osteoclastic variety. It is only the clinical features of the case which establish the diagnosis. The therapeutic test by X-radiation is also an aid to diagnosis. Response is more favourable and quicker in Hodgkin's than in neoplastic metastasis from carcinoma.

The röentgen changes of lymphadenoma of the spine may also be confused with undulant spondylitis, especially in a country like ours where brucellosis is prevalent, but in the latter the process is more destructive and the inter-vertebral disc is not spared. Of course, a positive blood serum reaction differentiates and clinches the diagnosis.

The case described is of particular interest, first because it shows the lymphadenomatous changes in the vertebrae which occur only in a small percentage of cases of Hodgkin's, and secondly because these changes probably occurred before the diseases became manifest clinically.

My thanks are due to Prof. J.E. Debono for permission to publish this case report.

"If there be anyone on whose ear my frequent and honourable mention of practical activities has a harsh and unpleasing sound because he is wholly given over in love and reverence to contemplation, let him bething himself that he is the enemy of his own desires. For in nature practical results are not only the means to improve well-being but the guarantee of truth. The true rule of religion, that a man should show his faith by his work, holds good in natural philosophy also. Science too must be known by works. It is by the witness of works. rather than by logic or even observation, that truth is revealed and established. Whence it follows that the improvement of man's minds and the improvement of his lot are one and the same thing".

FRANCIS BACON.

Nitrogen Mustard Therapy in Hodgkin's Disease

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As far back as the first World War it was observed that mustard gas had a cytotoxic effect on the haemopoietic tissues. In 1931, attempts were initiated to test its value in the treatment of neoplastic diseases, and at the beginning of the last war, experiments with its nitrogen derivatives were again renewed in England. It was in America, however, that reports of clinical trials were first published.

The nitrogen mustards in common use are the two aliphatic compounds methyl-bis (beta-chloroethy) amine hydrochloride and tris (beta-chloroethyl) amine hydrochloride. The first has been more universally used so far, but there is no therapeutic difference between the two. An aromatic nitrogen mustard, bis (beta-chloroethyl) naphthylamine, which is given orally and is less toxic, has been tested recently in the treatment of Hodgkin's disease and other conditions, (1) but extensive clinical trials are still forthcoming. Both the aliphatic compounds are readily soluble in water, when they undergo rapid chemical rearrangement, forming first cyclic ethylene-imonium derivatives, and later other relatively inactive compounds. Their therapeutic activity is due to the derivatives first formed in solution, which have a powerful effect on mitosis and on the intra-cellular enzyme system, causing mitotic arrest and nuclear fragmentation, an action which is similar to that of irradiation. Because of this effect, nitrogen mustard hydrochloride has been tried in the proliferative and in the neoplastic diseases of the haemopoetic tissues, such as Hodgkin's disease, chronic myeloid leukaemia, the reticuloses, reticulosarcoma, multiple myeloma and polycythaemia vera, as well as in mycosis fungoides and carcinoma of the lung. Hodgkin's disease and mycosis fungoides, however, responded best. In both diseases long remissions were reported by different workers, and in mycosis it was observed further, that the drug was most effective in those cases where the reticulum cells dominated the cutaneous infiltrations, leading to the conclusion that nitrogen mustard might have a selective action on this type of cell. (2)

Nitrogen mustard hydrochloride is supplied in a dry form in 10mg. doses. It must be dissolved in normal saline solution and is to be used immediately, otherwise hydrolysis will render the compound inactive. The usual dose is 0.1mg. per kilogram of body-weight, injected intravenously daily or on alternate days for a total of three to six doses, depending on the response and on the type of case. No further course of treatment should be undertaken within an interval of at least six to eight weeks. Lower or higher doses have been recommended in selective cases, but no single dose should exceed 8mg. The injection is best given early in the morning after a light breakfast.

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(1) B.M.J. — 1949-2-641.
Annual report of the Empire Cancer Campaign — 1948 p.59.
(2) B.M.J. — 1948-2-304.
Blood — 1947-2-564.

Since nitrogen mustard derivatives retain the vesicant properties of mustard gas, their administration requires expert intravenous technique, because undue damage to the endothelium of the vein will inevitably result in thrombosis, thus rendering subsequent treatment difficult or impossible. Leakage in the subcutaneous tissues should be scrupulously avoided, as it will cause a severe local reaction which may go on to tissue necrosis. Nausea and/or vomiting nearly always occur three to four hours after the injection, and loss of appetite and headache are frequently present during the course of treatment, but these side effects are of no consequence and can be disregarded. Opinions about the prevention and allay of these symptoms have been conflicting, American workers (1) claimed good results with pyridoxin hydrochloride injected intravenously in 200 mg. doses, while in England (2) this drug did not stop the nausea or allay the vomiting. Phenobarbitone was equally disappointing. However, the action of nitrogen mustard hydrochloride on the haemopoietic tissues is double edged, and haematological control should be maintained in all cases, ideally by means of bone-marrow smears. The effect on haemopoiesis is apparent within two to five days and is greatest by the eighteenth day after the last injection, and may be prolonged as far as the thirtieth day. At first, there is a fall in the total leucocyte count — a transient lymphopenia with a temporary increase in the neutrophils — rapidly followed by a decrease in granulocytes, which may take up to a month to return to the normal level (3). However, with the doses mentioned, the whites rarely fall below 2,000 per c.mm., and agranulocytosis has only been reported in less than one per

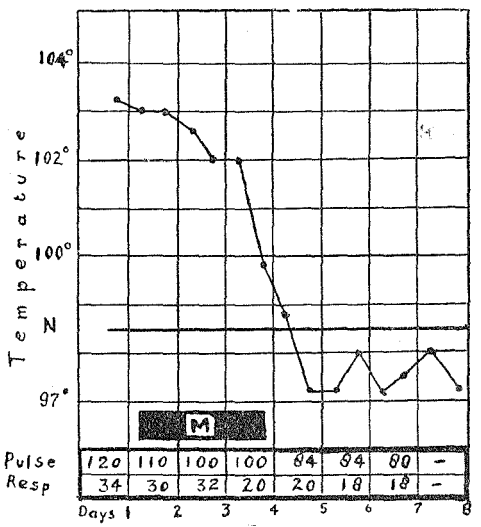

FIG. 1.

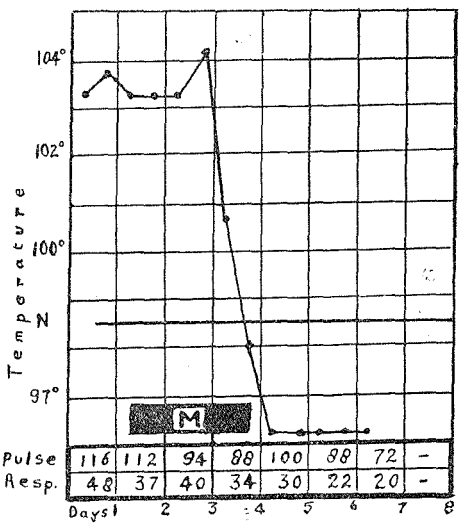

FIG. 2.

M — Nitrogen Mustard Hydrochloride.

(1) Shullenberger, Watkins, Kierland — 1949 — J.A.M.A. — Vol. 139. No. 12. p.773.
(2) Nabarro, J.D.N. — 1949. B.M.J. 2. p.624.
(3) Ibid.

cent of cases. The effect on the erythrocyte count is variable and usually insignificant. A fall in the platelets may occur, but is less frequent and the count seldom falls below 60,000 per c.mm. Purpura, however, has been observed in a number of cases, but, when it occurred, was transient and did not require any special treatment (1).

During the last year, the opportunity occurred to treat three cases of Hodgkin's disease with the 'bis' compound of nitrogen mustard hydrochloride. These did not belong to a selected group, but were the only cases available for treatment during that period. The daily dose given in each case was 0.1mg. per kilogram of body-weight. The intervals between repeated courses ranged from four to six weeks. The secondary anaemia was treated in each patient with iron and crude liver extract.

Case 1. A young man, aged 19 years. In September 1946, he had fever, anaemia and splenomegaly. For the last three years he had bouts of fever, with spontaneous remissions of not more than fifteen days duration. He was admitted to hospital on 23rd February 1949, complaining of abdominal colicky pains and shortness of breath. He looked very ill, anxious and dyspnoeic (respirations 36 per minute). The temperature was 103°F. and the pulse 120 per minute. The cervical and inguinal glands were enlarged. The spleen was 5ins and the liver 2ins below the costal margin. The red blood corpuscles numbered 3,250,000 per c.mm. and the white corpuscles 5,300 per c.mm. (polymorphs 50, lympho.32 and mono.18 per cent), the haemoglobin being 50 per cent (Sahli). A skiagram of the chest showed enlargement of the mediastinal glands and glandular biopsy revealed Dorothy Reed cells. The temperature ranged from 100° to 103°F. up to 25th March, when nitrogen mustard was given for three consecutive days. Except for nausea and vomiting for three hours after the injection, no untoward results were observed. On the second day of treatment, the temperature dropped down to 96°F., the respiratory rate returned to within normal and the glands disappeared almost completely. The spleen decreased by an inch, but there was no change in the size of the liver. The improvement in the general condition was remarkable, appetite increased, and there was progressive gain in weight. He was discharged from hospital on 13th May.

On 27th June, three months after the first course, a relapse was again treated with similar doses of nitrogen mustard and again there was a marked response (Fig.1), the patient being sent home three weeks after admission.

However, a week later, he was readmitted to hospital, and this time he looked extremely ill. The face was bloated and of a greenish pallor. The cervical glands were considerably enlarged and the spleen reached almost to the pelvic brim. He was very dyspnoeic and was running a temperature of 103°F. The red blood corpuscles were 2,850,000 per c.mm. and the white corpuscles 6,400 per c.mm. (polymorphs 60, lympho. 33, and mono.7 per cent), the haemoglobin being 45 per cent. A third course of mustard gas was again following by a remission, which was of five days duration. From then on, his condition deteriorated rapidly and he died in October 1949.

Case 2. The next patient, a young man of seventeen, noticed, in January 1949, a painful swelling in the left arm-pit; he had no fever and no other complaint, and the swelling subsided spontaneously after a few days.

In March 1949, he was remitted to hospital for 'Fever — unknown origin'. He looked ill, was pale and short of breath. The temperature was 104°F., the pulse 120 and the respiration 42 per minute. The cervical, the left axillary and the mediastinal glands were enlarged, while the liver was 1in. and the spleen 2ins below the costal margin. There was a moderately severe anaemia (red blood corpuscles 3,500,000 per c.mm., haemoglobin 50 per cent) and a leucocytosis of 23,000 per c.mm. (polymorphs 78, lympho. 12, and mono. 10 per cent).

On 19th March, nitrogen mustard hydrochloride was given for three consecutive days. On the third day, the general condition improved greatly, and the temperature went down to below normal (Fig.2). The glands vanished, but the liver and spleen did not decrease in size. Improvement was maintained and he was discharged at the beginning of April.

Eight days later he had a relapse (period of remission twenty one days). His condition had deteriorated considerably and he looked ill. He was very dyspnoeic and was running a temperature of 103°F. All accessible glands were enlarged

(1) B.M.J. — 1948. 2. p.305.

and he complained of severe abdominal colicky pains with loose stools. The haemoglobin went down to 35 per cent, and the white corpuscles were 8,800 per c.mm.

A second course of mustard gas was again followed by some improvement, the temperature going down to below normal. After five days the temperature again shot up to 104°F. and he died four days later.

Case 3. The last patient to be treated, a man 27 years old, had both nitrogen mustard hydrochloride and deep X-Ray therapy. For twelve months before admission, he had girdle pains. For the last three months, he ran a temperature of 100° to 102°F., at the same time noticing lumps at the side of the neck and in the left groin. He was admitted to hospital at the end of August 1949, looking thin and very pale. The temperature was 102°F., the pulse 120, and the respiration 28 per minute. There was splenomegaly and multiple glandular enlargement, but the liver was not palpable. The red blood corpuscles numbered 3,000,000 per c.mm. and the white corpuscles 10,500 per c.mm. (polymorphs 80, lympho. 28 and mono. 2 per cent), the haemoglobin being 50 per cent.

Nitrogen mustard hydrochloride was started on 8th September. The temperature dropped down to below normal after the first dose, but because of a rise the next day to 99°F., which persisted, six consecutive injections were given. Dramatic improvement followed. The glands decreased in size, the temperature settled to below normal and the patient felt so well that he was discharged as out-patient on 21st September.

A relapse occurrd a month later period of remission thirty seven days), but this time he did not look so ill as when first admitted. The temperature was only 99°F., the glands had not increased in size since his discharge from hospital, but moderately severe anaemia was still present, the white cell count, however, remaining within normal limits. This time he complained of severe pain in the chest and in both knee-joints, but no neurological signs were present. Skiagrams of the chest and of the spine showed mediastinal enlargement and lymphadenomatous involvement (D11, D12; L1, L2) respectively.

A second course of six injections of nitrogen mustard was again followed by a remission and patient was discharged on 1st November.

He had to be readmitted, however, twenty days later with a temperature of 102°F. The glands were all enlarged, but there was no pain and he did not feel very ill. Because of the short remission and of the bone lesions, deep X-Ray therapy was tried, but three sittings of filed radiation at twenty four day intervals did not have any effect on the temperature and the general condition remained stationary throughout. On 10th February, a further course of three consecutive doses of mustard gas was followed by a sudden drop in the temperature and an improvement in the general condition. The temperature rose up again a month later, and in spite of another trial with X-Ray therapy, it persisted between 101°F. and 103°F. up to the end of March. Three doses of mustard gas at alternate days again brought on a remission, which has persisted so far.

The intensive treatment in this case was checked by frequent blood tests, which remained satisfactory throughout. Serial X-Rays showed that there was no progression or regression in the bone lesions, though pain did not recur.

It is readily admitted that the small number of cases described have no statistical significance, for they fall far short of the requisite data, yet in such a relatively rare condition as Hodgkin's disease every little helps. It is interesting, however, to point out that the results obtained in this small series compare well with those described in the literature to date.

The immediate objective response to treatment was, in all cases, a sudden drop of the temperature to below normal and an appreciable decrease in the size of the enlarged glands. The spleen was very little affected, and the liver not at all. Case 1 was a disseminated Hodgkin's. The better results obtained in this instance (immediate lowering of the fever, improvement in the general condition, longer remissions) agree with those reported by Nabarro in 1949 (1). He observed that nitrogen mustard therapy was encouraging in the chronic disseminated case, not very satisfactory in the acute type (case 2 in this report) and wholly disappointing when localised involvement predominated;

(1) Nabarro, J.D.N. — 1949, B.M.J. 2, p.625.

in such cases irradiation by roëntgen rays should be the treatment of choice. Case 3 was interesting because of the lymphadenomatous changes in the spine — an unusual site of metastasis in a disease which is itself uncommon — and because it proved beyond doubt that disseminated lymphadenoma fares better with mustard gas than with X-Ray treatment.

As regards side effects, none other than nausea and vomiting (case 1) were encountered in this series. Blood tests were carried out periodically, but did not show any of the complications described in the literature.

Up to the present, the nitrogen mustard derivatives far from solve the problem in the treatment of the lymphadenopathies and allied diseases, yet they have a right to claim a definite place as palliative measures. Their availability and the comparative ease of administration are certainly an advantage. At least, remissions from disturbing symptoms, and therefore a more tolerable life for the patient, can be obtained in those cases which formerly did not respond to the only treatment then available — irradiation. Moreover, in the terminal stages of the disease, a dramatic remission may occur; this means prolonging life, and, where there is life there is always hope! For, although the importance of the nitrogen mustards lies not in their immediate therapeutic application, yet better understanding of their mode of action may prove the advent of a related compound which is more powerful and more specific.

My thanks are due to Prof. J. E. Debono, Senior Physician, St. Luke's Hospital, Malta, for advice and for allowing me to treat the patients under his care.

"A long training of my fingers besides the sphygmomanometer has taught me how fallacious the finger must always be".

PROFESSOR GIBSON.

"It is, at the most, poetic licence to compare the popular approach to the doctor with that of some primitive tribesman to his tribal magician: the doctor makes magic passes with his wand of office (a stethoscope), writes out a magic incantation (a latin prescription), and orders a magic potion (a bottle of medicine) to be taken with due regard to magic ritual (t.d.s, p.c.). Too often, both the doctor and patient then seem to feel that without any further effort or co-operation on the part of the patient, all will shortly be well — even without the patient knowing what is wrong with him and why; and what he must do, and why".

"The Health Education Journal", October 1949.

THE FELLOWSHIP FOR FREEDOM IN MEDICINE (LTD.)

Chairman: The Rt. Hon. Lord Horder, G.C.V.O., M.D.
Vice-Chairman: R. Hale-White, M.D.
Hon. Treasurer: G. H. Rossdale, M.D.
Hon. Secretary: E. C. Warner, M.D.

Associate membership of the Fellowship is open to all registered medical students. For the nominal fee of 2/6, associate members will receive copies of the "Bulletin" and other literature published by the fellowship.

HOW THE FELLOWSHIP STARTED

In May, 1948, the Profession, after an initial protest, capitulated to economic pressure and accepted the National Health Service Act as it now stands. It is quite plain that since that date medical standards have been lowered through the increasingly difficult conditions of work, and that patients and doctors alike have been deprived of many of their essential freedoms.

Following this capitulation, Lord Horder received hundreds of letters urging him to take action to retrieve the situation. This evidence of widespread dismay resulted in Lord Horder calling a meeting in November, 1948, which was attended by 700 doctors from all parts of the country, and the Fellowship for Freedom in Medicine was formed.

The Fellowship publishes a Bulletin which contains information and views founded on the reports of an analysis subcommittee, and keeps in the closest contact with the Press, both in this country and abroad, so as to give publicity to the adverse effects that the present National Health Service Act is having on the welfare of the public.

Our present objective is to secure those intensive amendments of the National Health Service Act which are necessary for the furthering of the high standards of medicine, and for the return of freedom for patients and doctors alike.

Particularly do we aim to abolish the dictatorial powers over the medical profession given to laymen, whether Politician or Civil Servant, and also to restore facilities for those who wish to receive medical treatment outside the Act.

We do not under-rate the urgent importance of rectifying the many cases of financial inequality and the hardships which have arisen, but we regard this matter as only one of several that must be tackled.

Although the F.F.M. deplores the collapse of resistance in the B.M.A., which led to the surrender in 1948 of freedom in medicine, nevertheless it recognises the B.M.A. as the principal body representing the profession, and will use its influence to support the policy of the Association, provided that this is directed energetically towards the re-establishment of the profession's essential freedoms.

OBJECTS OF THE FELLOWSHIP

(a) To insist upon the preservation of the highest standards of medical practice.

(b) To protect the public and the medical profession from state monopoly in Medicine.

(c) To preserve the ethical and professional freedom of the individual doctor in the service of his patients and to maintain the status of the general practitioner, including his financial security.

(d) To oppose all encroachments by the State on the independence of medical educational institutions and to maintain the academic freedom of all teachers of Medicine.

(e) To define the limits of State Medicine so as to protect the rights of the public and of the medical profession in relation to all types of independent practice.

March, 1950.

45, Nottingham Place,

London, W.1.

The Truth About Bacterial Warfare

E. AGIUS B.Sc., M.D., D. P.H., D. Bact. (Lond.)
Additional Lecturer in Bacteriology.

Through a series of strange psychological factors a considerable number of people these days have developed a habit of worrying about real and fancied dangers, a habit which is destroying their delight in living and hampering their energies which are, in fact, more than ever necessary in these hard times. One of the bogeys casting their shadows on human activities is the fear that some nation will wage war by bringing about an epidemic in the country of its adversaries. Such an epidemic would be caused by the dispersal of disease germs, whether bacteria proper, viruses or rickettsiae.

The idea is not new, and in fact somebody once pointed out that bacteriological warfare was used in the siege of Malta in 1565, when the defenders attempted to foul the springs from which the Turkish forces were drawing their water with the faeces of dysentery patients. The attempt does not appear to have been successful.

There are certain general considerations to be made. Firstly, can a disease so spread among a population that it will affect the power of that nation to continue waging war? The answer to that is certainly a positive one. There have been many occasions when naturally occuring disease has determined the outcome of a war. Secondly, is the artificial starting of an epidemic technically possible? One might have hesitated in answering that, but after the construction of the atomic bomb, there is no reason for saying that, especially if the resources of a great power are available, the technique of bacterial warfare is so difficult as to be impracticable. In fact, I believe it is easier than atom-splitting.

In this problem one must be guided not only by bacteriological but also by epidemiological principles. It is useless to have just a few cases of disease. It is said that in the 1914-18 war the enemy managed to raise the incidence of a certain illness by allowing females contaminated with it to stay behind in some cities which had otherwise been evacuated and which were being occupied by the allies. This did not have any great military value because the disease in question did not spread far enough and soon enough, nor did it kill its victims quickly enough. The disease one would aim at starting therefore would have to be one liable to assume epidemic proportions.

One of the simplest ways of starting an epidemic would be by contamination of food or water supplies. Water, consumed in some way or other by the whole community, is much more open to this danger, and in the 1939-45 war the possibility either of chemical poisons or of bacteria being dropped in the reservoirs was actually considered and guarded against. It does not follow that of a hundred people who drink polluted water a hundred will fall sick, but certainly the percentage will be large enough to hamper very seriously a war-waging community, and if such a bacterium as the vibrion of cholera is used, the percentage will be very large indeed. The point of great technical importance in these cases is that the typhoid bacterium and more so the cholera germ are hardy enough to withstand adverse conditions.

One bacterium, the use of which has been considered for purposes of war, is the *Pfeifferella mallei,* the causative organism of glanders. Glanders is primarily a disease of horses, but humans can be

attacked, and in acute cases death invariably follows in a week or ten days. This bacterium has often attacked laboratory workers, and when a centrifuge tube broke in a laboratory at Czernowitz, in Austria, many of the persons present were affected. This incident has given some sweet soul the delectable idea of a glanders bomb, and it seems to be technically possible. What is more important is the fact that the virulence of bacteria can be artificially heightened so that a micro-organism which is not normally very dangerous can be made to become so. This is an extremely important principle. Bubonic plague, for example, is not a very serious disease in a clean community. Pulmonary plague, on the contrary, is an extremely dangerous one which spreads very quickly and is very often fatal. It would be possible to select and propagate a *Pasteurella pestis* with a special pulmonary affinity.

The commoner of the diseases which are spread by droplets, that is by the small drops which are expelled while breathing, speaking or sneezing, and which are therefore very contagious, are produced by the type of micro-organisms called viruses. Viruses do not survive very well outside certain conditions which are not likely to occur elsewhere than in a laboratory. This implies the necessity for their introduction into a community of the bringing in of a human sick person to act as a reservoir of infection. Such a necessity, of course, hampers the bacterial warfare machine, but the difficulty is not likely to be unsurmountable.

One rather engaging way (strictly from the amoral technical point of view) of spreading a disease would depend on the use of the plasmodia of malaria. Letting loose a number of infective mosquitoes might be effective — and malaria, especially among a population which provides virgin soil to it, would be fairly crippling to the prosecution of a war. To add a touch of fantasy, one might imagine the simultaneous dropping into the country either of infected human beings or of infected monkeys, thus ensuring that the cycle of malaria takes place.

Another method of applying bacterial warfare lies in attacking a nation's foodstuffs. Diseases of such food crops as potatoes and wheat could be started by the use of bacteria or of viruses (through the introduction of infected plants). Even the introduction of such cattle diseases as rinderpest are not beyond possibility. By these means a country might be starved almost as effectively as by a siege.

The one feature of bacterial warfare which is likely to limit its use is its very effectiveness. If an epidemic is started which spreads fast and wide enough to be of military use, there is no foreseeing that it would not extend beyond frontiers. Bacterial warfare would be best used, perhaps, between two countries separated by long distances. Even then with modern means of communication there are serious dangers, and in any case, most wars come about between neighbours and not between distant countries. It is difficult to imagine an epidemic decimating France, for example, which would not sooner or later pass into Germany and thus lead to the engineer being hoist with his own petard. I do not believe it practicable for a nation plotting to use a special bacterium to vaccinate its own nationals first to safeguard against this boomerang effect. The immunity which can be so attained is hardly ever strong enough.

Another consoling thought is that at the International Congress of Microbiology at Copenhagen in 1947, at which many of the most distinguished bacteriologists of the world were present, it was resolved and carried unanimously to join with the Society of Cellobiology in "condemning in the strongest possible terms all forms of biological warfare. The Congress considered such barbaric methods as absolutely unworthy of any civilized

community and trusted that all microbiologists throughout the world would do everything in their power to prevent their exploitation." Unfortunately, however, there were not at that congress any representatives of Russia, Japan, Germany and several other countries. Moreover, the resolution was carried by acclamation and there was no discussion. It would have been more certain that everybody really meant to agree if there had been some discussion. But perhaps nobody opposed that motion because anybody would have been ashamed to do so. Maybe in the last resort, it is in this shamefulness of distorting to war purposes a technique which has so far been solely directed towards healing and the universal benefiting of mankind that our salvation lies. May be human beings are not such idiots as they occasionally seem, after all. Still one cannot be too sure. The drums of war generally drown the voice of reason, and scientists will find some excuse or other, or possibly even some sound logical reason to salve their conscience, and engage in bacterial warfare. Lord Fisher used to say "War is the essence of violence. Moderation in war is imbecility." All the more reason therefore for preserving peace, a thing fortunately very easy of achievement. As Arthur Mee used to say, all we have to do is for all of us to observe the ten commandments.

"In the fields of observation chance favours only the prepared mind".

PASTEUR.

".....we must not explore the chest by percussing our ideas into it".

FRIEDRICH MULLER.

The Origin and Evolution of Life

VICTOR CAPTUR B.Sc., M.D.

THE problem of the origin and evolution of life has been and still is fascinating, and its solution is the scientist's highest ideal. Much has been written and said about this problem; theories were put forward, but nothing concrete has been proved. Some blamed the Church, others the materialism of men of science; in fact the problem has been the subject of much bitter controversy.

In such a short space it is only possible to outline broadly some of the theories put forward in favour of evolution, theories which are the outcome of research work by famous scientists. It is not necessary to admit them; we shall try to analyse them and to see what is to be admitted or rejected.

What is meant by the theory of evolution? Evolution supposes that life crept from the sea to the dry land; from fish to reptile, from reptile to bird, and from bird to mammal and so to monkeys and sub-men. This presents several weak points, and although there are many arguments that favour an evolution, there is no way to prove it scientifically. The majority of scientists admit the fact of evolution; the subject of controversy is the how and why it occured. How was the first man born? Nobody knows. Discussing the resemblance between man and ape in their embryonic stage Sir. P. Chalmers Mitchell writes: "the faces and features, the domed forehead covering the capacious brain, the practical absence of hair, and every minute detail of the internal and external structure, agree with a fidelity that is almost shocking. Professor Metchnikoff was so impressed by such resemblances that he has suggested that the human race may have taken its origin from the precocious birth of an ape."

This is, of course, yet another theory. If we admit an evolution from the lowest animal up to the monkeys, why should we not admit the evolution of man? And if we do, how are we to reconcile ourselves with the first chapter of Genesis: "And God said, Let us make man to our image and likeness: and let him have dominion over the fishes of the sea, and the fowls of the air, and beasts, and the whole earth, and every creeping creature that moveth upon the earth; so God created man in his own image, in the image of God created He him; male and female created He them."

The studies which biologists used in trying to justify evolution are numerous. Georges Cuvier admitted the hypothesis of succesive creations which d'Orbigny tried to prove admitting successive geological cataclysms which destroyed the pre-existing animals. But we know today that such cataclysms all the world over did not happen; the transformations of the earth are very slow as they happen in our times.

The study of heredity did not solve the problem although it cleared some points. The variations from one generation to another were shown to be so insignificant that biologists gave up hope of finding a solution by the application of this study.

Lamark said that evolution was dictated by the use and disuse of organs. He explained his theory by giving puerile examples. He attributed, for instance, the length of the giraffe's neck to the necessity of the animal to eat the leaves of tall trees, and this effect was transmitted to its young. For the possibility of this phenomenon it is necessary to admit the transmission of acquired characters which experiments in heredity deny. Lamark's theory says that the modifications in an animal produce at length a different kind

of animal, modifications which arise in each individual in the course of its life, by its activity in response to the stimuli it receives from its surroundings. This, of course, is not correct.

Charles Darwin, the prophet of evolution, attributed the cause of evolution to natural selection. The conclusions of the great naturalist are, however, subject to criticism because of the weak points they present. Paleontology, for example, has revealed instances in which a feature continued to evolve even when it ceased to be useful. Another weak point is the rareness of variations of effective magnitude.

Ernst Haeckel, the German biologist, using embryology as a basis for his arguments, formulated his famous law which says that "Ontogenesis repeats Phylogenesis," that is to say, that every individual in his embryonic stage (Ontogenesis) repeats in short the principal stages from which he has passed to be what he is today (Phylogenesis). An egg, for instance, transforms itself into an aquatic animal (tadpole), this loses its tail, and legs appear so that a terrestial animal is formed (frog).

All these are, however, theories and one dare not admit them unless they are proved to be true. If it is so difficult to prove the passage from a simple form to myriads of complicated and higher beings, how can scientists hope to solve the problem of the origin of life?

A most convenient, but unacceptable, theory was put forward by the Swedish scientist Savante Arrhenius. He explains how life was brought from other planets by germs impelled by the pressure of light towards the earth. This solution is certainly not satisfactory because it is known that in the intersidereal spaces exist waves of such high frequency that any germ would be mercilessly killed. The distance of the planets from the earth is so great that it would have taken many years for the germs to migrate and certainly they could not have resisted the intersidereal cold for such a long time. All that Arrhenius did was to transfer the problem from this earth to other planets, and in these planets how did life originate?

How can we then explain the origin of the first living matter? We are faced with two principal ideas:— The first admits of a creative act by a divine being. The second is that of the formation of organic matter from the inorganic. One is Faith, the other is Science.

Can the two go hand in hand? Certainly, if we admit the intervention of a Creator. If biochemists were to succeed in creating life artificially in the laboratories, the problem of the origin of life would no longer exist. No scientist can claim that great feat. No living protoplasm has ever been created by artificial means.

Great progress has, however, been made with the help of Chemistry and it has been possible to form artificially organic compounds from inorganic matter, a process which is after all continually going on during plant photosynthesis. The result at one time roused the hope of success. In 1911, Moore succeeded in a series of experiments in the formation of formaldehyde and substances interpreted as carbohydrates. In his experiments he subjected to the action of ultra-violet rays a colloidal solution of Uranium, Iron, and Aluminium through which Carbon dioxide was bubbled. Baly went a step further and obtained fructose and glucose. Later, by subjecting to the action of ultra-violet rays a solution of Potassium nitrate saturated with Carbon dioxide, he obtained Glyoxalin, Alkaloids, and Amino-acids. In ordinary language, Moore and Baly artificially produced the most simple nitrogenous substances which are indispensable for the formation of proteins; and proteins are very complex chemical bodies which go to build protoplasm. These are

in themselves very interesting results but leave the problem as obscure as ever.

The hope of success, however is not yet dead. In fact, the great physiologist Jacques Loeb once said that he could not find any reason to justify the pessimistic conviction that the results desired could not be achieved. He went on to say that it would be a great help to science if the hope of resolving the problem was encouraged in young biologists as the most elevated ideal in biology.

What we must reject is the materialistic doctrine which was formulated by Haeckel. According to this doctrine, life has originated from inorganic matter by spontaneous generation, the successive evolution directed by a blind determined law, without the intervention of the first cause, which by hypothesis does not exist. With regard to this Dr. Phillips says: "What philosophy can tell us, then, about evolution is first, that purely materialistic evolution of the type put forward by Haeckel is impossible; and, secondly, that any theory of evolution which sets out to give an account of the way in which the animate world has come to be in its present state, and aims at making such an account satisfactory from the philosophical point of view, i.e. as giving an ultimate explanation of the whole matter, must take account both of teleology and purpose, and of the action of the first cause."

In other words, any theory of evolution must admit that everything was made for an end; there is no blind determined law here. Even if we admit that man's body is derived from other forms of life his soul is not so derived.

In conclusion we may quote the late William Bateson, the English biologist: "In dim outline evolution is evident enough. From the facts it is a conclusion which inevitably follows. But that particular and essential bit of the theory of evolution which is concerned with the origin and nature of species remains utterly mysterious."

Bibliography

1. Grahame Clark. "From Savagery to Civilisasation".
2. T.H. Huxley. "Man's Place in Nature".
3. O. D. Maguinness. "Environment & Heredity".
4. R. P. Phillips. "Modern Thomistic Philosophy".
5. Sir P. Chalmers Mitchell. "The Childhood of Animals".
6. G. Cotronei. "Biologia e Zoologia Generale".
7. H. S. Jenning. "Eredità Biologica e Natura Umana".
8. F. Sacco. "Origini ed Evolusioni della Vita".

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The degree of M.D. was conferred by the Royal University of Malta, on 1st October, 1949, on the following gentlemen:

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