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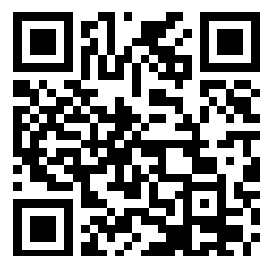
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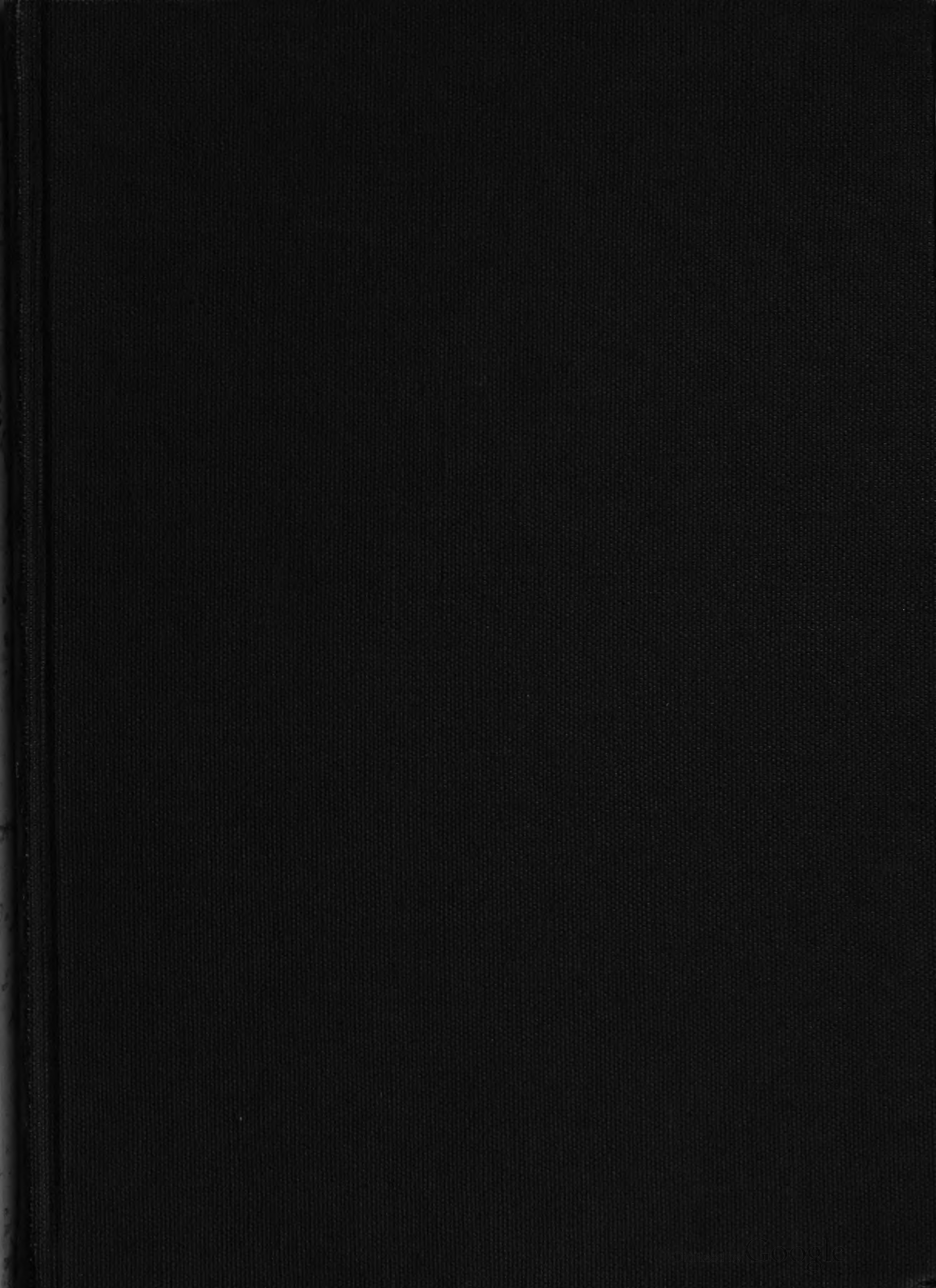
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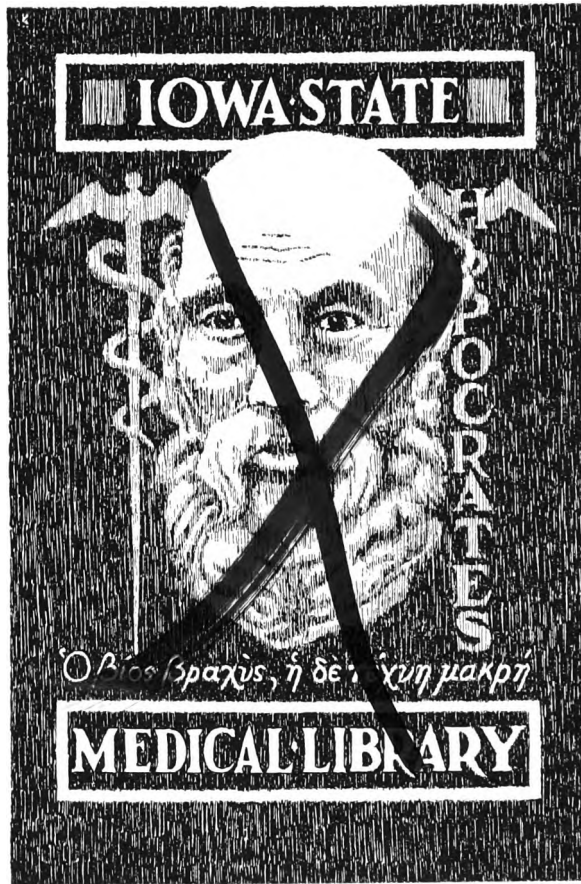
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SOME REFLECTIONS ON  
GENIUS \*

W. RUSSELL BRAIN  
D.M. Oxf'd, F.R.C.P.

Galton<sup>10</sup> used the term "hereditary genius" to express "an ability that was exceptionally high and at the same time inborn." Kretschmer<sup>14</sup> proposes a different definition:

"We shall give the name genius to those men who are able to arouse permanently, and in the highest degree, that positive, scientifically grounded feeling of worth and value in a wide group of human beings. But we shall only do so in those cases where the value arises with psychological necessity, out of the special mental structure of the bringer of value, not where a stroke of luck or some coincidence of factors has thrown it in his lap."

Galton later<sup>12</sup> wished that he had called his book "Hereditary Ability." Thus he clearly recognised that the subject of his study was in some respects different from genius in the popular sense of the term, which is broadly the meaning defined by Kretschmer. Galton was concerned with the general laws of the inheritance of exceptional ability, which is often an important factor in genius in the popular sense. Kretschmer is interested in the particular psychological qualities which distinguish the genius from persons who merely possess exceptional ability. The two approaches are complementary to each other.

When Galton uses the term "ability" what does he mean by it? He means ability to be a judge, a statesman, a poet, a musician and so on, in other words to be exceptionally successful in one of a variety of callings. Are we therefore justified in concluding that some unitary factor underlies these varied manifestations of "ability," such as "the ability to acquire and manipulate concepts" postulated by Terman<sup>23</sup> as "the *sine qua non* of genius"? Galton's own work shows that such a view is too simple, for he demonstrated that some forms of hereditary ability manifest themselves in various spheres of activity, but others do not. Thus judges, statesmen, and poets and other literary men appear fairly frequently in each other's families. Scientists have many relations who are scientists and a smaller number who distinguish themselves as men of affairs, but few writers and almost no poets, artists, or musicians among their relations. And the eminent relations of artists tend themselves to be artists, and those of musicians to be musicians. Galton himself pointed out that Mendelssohn and Meyerbeer were the only musicians on his list whose eminent kinsmen achieved success in careers other than as musicians. Some allowance must be made for environment in the shape of family tradition, but I do not think that this can explain the variability of the manifestations of hereditary ability in some families and its comparative fixity in others.

I suggest that these differences depend on differences in the organisation of the nervous system. And that leads me to ask, since the genius is by definition abnormal, and is so by virtue of an abnormal nervous system, what is the relationship between the nervous abnormality we call genius and those more familiar abnormalities we call disease.

THE CEREBRAL BASIS OF GENIUS

How does the brain of the genius differ from that of the ordinary person? Burt<sup>3</sup> has proposed a physiological interpretation of intelligence:

"The mental processes essentially required by intelligence tests involve the integration of a variety of perceptual and motor activities into a systematic whole: the more the

\* Abridged from the Galton lecture delivered before the Eugenics Society on Feb. 17, 1948, and reproduced by permission of the Editor of the *Eugenics Review*, in whose April issue the lecture appeared in full.

processes tested depend upon this integration the closer they correlate with intelligence."

The nervous system consists anatomically of units—the nerve-cells—which are very much alike, but we must not conceive of the genius as being necessarily more richly endowed with nerve-cells than the ordinary person. What is important is their organisation. Nerve-cells are grouped into functional patterns, which are best called "schemas." Where the genius excels the ordinary person is that in some respect he is richer in schemas. This may mean that he has more nerve-cells, we do not know, but it is quite possible for the same number of cells to be arranged either in simple or in complex patterns, just as a child's reader and Shakespeare's works are composed of the same twenty-six letters; and the normal number of nerve-cells is so large that differences of organisation by themselves could account for profound differences of functional capacity. Without going into the question of what is being tested by intelligence tests, and whether the function being explored is single or multiple, there can be no doubt that it is a function or a group of functions of a highly special kind. The schemas are those concerned in conceptual or abstract thought. This is of the essence of some kinds of genius, but by no means of all. Consider the different parts played by intelligence in the philosopher, in whose work conceptual thought turns round and reflects upon itself, the scientist who directs it upon the data of observation, and the artist in whom its rôle is altogether more obscure and intimately related to feeling.

THE USE OF WORDS

The relationship between intelligence and the use of words is of special importance for the study of genius. No doubt thinking of some kind can occur without words, but the whole of human culture has been rendered possible by the evolution of speech. We do not first have thoughts and then put them into words; we use words to think; or, to be more accurate, the schemas which underlie the use of speech play an essential part in the construction and evocation of the schemas for conceptual thought. This does not mean that intelligence is identical with the capacity for speech, but that in the individual, as in the history of the race, the higher levels of conceptual thought are attainable only in the presence of a highly developed capacity for the use of verbal symbols. Just as intelligence exhibits a wide range of variation throughout a population, so also does speech. Indeed, there is evidence that different functions concerned in the use of verbal symbols may vary independently, and this is especially true of the use of visual symbols in reading and writing. Extreme degrees of congenital "word-blindness" attract attention early; minor defects of reading, writing, and spelling are probably much commoner and constitute permanent handicaps in intellectual development. At the other extreme high literary ability may occur in families—e.g., the Brontë sisters. These facts suggest that hereditary factors may in part determine whether a person's capacity for verbal symbolisation is subnormal, normal, or above the average.

MEMORY

Memory plays a vital part in both speech and intelligence. Many great writers have possessed remarkable memories. Boswell<sup>16</sup> says that Dr. Johnson's memory "was so tenacious that he never forgot anything that he either heard or read." Coleridge described his own memory as "tenacious and systematising." Having read a book in the morning he could in the evening repeat whole pages verbatim. It was, as Lowes<sup>18</sup> says, "one of the most extraordinary memories of which there is record, stored with the spoils of omnivorous reading, and endowed into the bargain with an almost uncanny power of association."

Shelley is said to have been able to read for sixteen hours a day: "He took in seven or eight lines at a glance, and his mind seized the sense with a velocity equal to the twinkling of an eye. Often would a single word enable him at once to comprehend the meaning of the sentence. His memory was prodigious."<sup>24</sup> Taking speech alone into consideration, the better the memory the larger the vocabulary and the greater the richness and differentiation of thought.

#### INSPIRATION AND THE UNCONSCIOUS MIND

Perhaps the most remarkable feature of the creations of genius is the extent to which they arise independently of the conscious mind. This has always been recognised by poets and artists. Inspiration means the inbreathing of an impulse from without, felt to be in some way separate from the conscious personality, and often therefore personified by primitive thought. As Goethe<sup>4</sup> put it: "No productiveness of the highest kind, no remarkable discovery, no great thought that bears fruit and has results is in the power of anyone; such things are above earthly control." The process of creation is apt to be accompanied by a high degree of emotional excitement, so that often the artist feels possessed, and compelled to work with continuous energy until he has fulfilled his task. Those who are interested in the psychology of poetic inspiration will find it analysed at length by Lowes,<sup>16</sup> who traces the sources of the images in *The Ancient Mariner* and *Kubla Khan*, and shows how they become modified and fused in the unconscious to emerge in *Kubla Khan* as a dreamlike stream of fantasy, but in *The Ancient Mariner* subdued and integrated by creative thought.†

The ordinary man has been prone to dismiss poetic inspiration as a harmless form of madness of no interest except to the few eccentrics who enjoy poetry. But the geniuses of science have recognised that the inspiration which leads to scientific discovery does not differ from that of the poet in its nature but only in its subject matter.<sup>18</sup> An admirable illustration of this is given by Poincaré<sup>19</sup> in a discussion of mathematical discovery:

"One is at once struck by these appearances of sudden illumination, obvious indications of a long course of previous unconscious work. . . . This unconscious work . . . is not possible, or in any case not fruitful, unless it is first preceded and then followed by a period of conscious work. These sudden inspirations are never produced . . . except after some days of voluntary efforts which appeared absolutely fruitless, in which one thought one had accomplished nothing, and seemed to be on a totally wrong track. These efforts, however, were not as barren as one thought; they set the unconscious machine in motion, and without them it would not have worked at all, and would not have produced anything. The necessity for the second period of conscious work can be even more readily understood. It is necessary to work out the result of inspiration, to deduce the immediate consequences and put them in order, and to set out the demonstrations, but, above all, it is necessary to verify them."

Here a mathematician of genius is describing precisely the same process as went to the making of *The Ancient Mariner*.

The creative genius, whether he be an artist, a scientist, or an abstract thinker, possesses this unconscious capacity to an extent far exceeding that of the ordinary man. It seems to presuppose a memory capable of retaining all the relevant data and associative processes of exceptional richness by which the data can be brought together into novel and fruitful combinations in what Galton,<sup>11</sup> who also studied creative thinking, called "the antechamber of consciousness." These unconscious mnemonic and associative functions depend on the richness and complexity of those physiological dispositions of nerve-cells we have called "schemas." The artist in

words must be unusually well equipped with verbal and ideational schemas, but what kind of artist in words a man is will depend on subtle differences. The philosopher and the poet are both word-users, but how differently they employ them! Galton<sup>11</sup> said: "An over-ready perception of sharp mental pictures is antagonistic to the acquirement of habits of highly generalised and abstract thought, especially when the steps of reasoning are carried on by words as symbols."

#### POETIC GENIUS

The poet, who uses words to evoke images, and images to move and delight, is the very opposite of the thinker, who must detach his thought from the concrete and purge it of feeling. Can anyone doubt that these differences between geniuses and ordinary folk and between one type of genius and another depend on differences of neural organisation, partly innate and partly developed by use? What a supreme development of the cerebral processes of speech must have been present in Shakespeare to have provided him with that vast vocabulary from which he drew inexhaustibly fresh felicities of phrase to startle us with their beauty. And how rich must have been his neural centres of feeling to have enabled him to respond in sympathy with every note of the gamut of human passion, and find words for every nuance of love and hate, pity and terror.

The poet uses words to evoke images, and images to arouse feelings, and he employs new combinations of words to shock his readers into new experiences or to revivify old ones. And most poets have believed that these combinations of words should excite pleasure in virtue of rhythm and rhyme or assonance. Anyone who has the smallest experience of writing verse knows that the choice of words is only to a very limited extent conscious, and this is equally true of words representing images or ideas, and of words as pleasurable combinations of sounds. Mr. Ivor Brown<sup>2</sup> makes this point in his comments on these lines of Shakespeare:

"Can such things be  
And overcome us like a summer cloud  
Without special wonder?"

"What a symphony on the 'u' sound is here," says Mr. Brown. "How far was Shakespeare's knack of pouring high emotion into such enchanting melody a consciously contrived thing? Perhaps this kind of assonance just bubbled up in him as second nature. He can never have found the time to give each line a day of contemplation."

"High emotion" is the purpose of the creative writer who is a poet, novelist, or playwright, and he must therefore possess a rich development of those basal structures of the brain which are concerned with feeling. As a result he is able, as Shelley said in describing his own powers, "to apprehend minute and remote distinctions of feeling, whether relative to external nature, or to the living beings which surround us." Surely it is the alliance of this high development of feeling with intelligence and the capacity for expression that makes the creative artist. And it is this which distinguishes Coleridge the poet from the many other Coleridges of outstanding intellectual capacity that his family produced in successive generations. Though these functions are distinguishable in thought, and even depend on areas of the brain which are anatomically distinct, we must recognise that in artistic creation they are integrated into a unity, for reflection enriches and subtilises feeling, and the word is a true creator of thought. As Blake<sup>9</sup> put it: "Ideas cannot be given but in their minutely Appropriate Words, nor can a Design be made without its minutely Appropriate Execution."

#### ADMINISTRATIVE GENIUS

I cannot do more than allude to the psychological characteristics that distinguish the great military

† See also Richards<sup>22</sup> and Lewis.<sup>15</sup>

leader, statesman, and administrator, and which, as many genealogies show, are often inherited. The genius in these fields must possess an outstanding intelligence which operates on the minds of men as well as on their material circumstances. As with the artist, however, it is a special blend of feeling with thought that enables his cerebral schemas to reflect the thoughts and feelings of his fellows, and to modify the pattern of events by discerning in them meanings that elude the less gifted. But his task is far harder than that of the novelist or playwright, for he must take his characters as he finds them and, by his superior knowledge and will, impose his plot upon theirs. He is the artist in action.

#### MUSICAL GENIUS

Musical genius presents features which suggest that it depends on a highly specific development of the nervous system. Musical ability is inherited, and it does not seem to be correlated in inheritance with any other form of ability. The most notable example is the Bach family, which was actively musical for seven (or, according to Galton, eight) generations.

"Of some sixty Bachs known by name and profession all but seven were organists, cantors or town musicians, many of them of eminence in their professions."<sup>11</sup>

The innate character of musical talent is illustrated by the extremely early age at which it is often exhibited, as, for example, by Mozart and Beethoven, and music teems with infant prodigies. The sense of absolute pitch probably depends on the inborn organisation of the nervous system. Mozart exhibited it at the age of seven. Sir Frederick Ouseley at the age of five said: "Only think, Papa blows his nose in G!" The greatest musicians do not always possess it; Schumann and Wagner, for example, did not.

We cannot say what is the neural basis of musical genius without first knowing what cerebral activity underlies the enjoyment of music in the average person. Clearly there must be good hearing and a high capacity to discriminate musical notes, which is probably cerebral rather than auditory.<sup>11</sup> But this in turn must meet with a responsiveness of the feeling centres, so that certain combinations and sequences of notes cause not only pleasure—or discomfort—but also other feelings, which vary in their intensity and definiteness in different persons. To this executants add a motor skill.

It may seem useless to ask why music arouses emotions, and certain sorts of music certain emotions; there is no answer in terms of thought. I suggest that the answer is to be found in terms of cerebral function—that in musical people the electrical rhythms excited in the hearing centres of the brain by musical sounds evoke resonances in the rhythms of the emotional centres, so that such people respond to music with feeling.‡ The unmusical lack these resonances, either because their auditory discrimination is too poor, or because they do not possess the linkages between hearing and feeling. The musical genius has both in high degree, and since, unlike the artist in words, he has no vocabulary to learn and needs no experience of life as his raw material, he comes into the world almost fully equipped to exercise his talent, and has only to acquire the necessary skill with his hands.

One characteristic that sharply distinguishes musical genius from musical appreciation remains to be mentioned. No composer of genius has been a woman, and this must surely be due to innate and not cultural causes, for women have not lacked access to musical instruments. Indeed, as executants they can hold their own with men on many; and more women than men

appreciate music, if one may conclude this from the presence of twice as many women as men at public concerts in this country. Does the fact that men make music for women to enjoy support Darwin's theory<sup>5 6</sup> that the biological link between sound and feeling in music lies in the fact that music is a highly developed form of the sexual calls of animals?

The concept of physiological schemas underlying both the conscious and the unconscious processes of mind can be used to bring the *idiot savant* and the calculating boy into line with the conception of genius here proposed. These bizarre and limited geniuses are freaks endowed with the schemas of genius in a narrow field, but their schemas work physiologically and not psychologically, so that the process, like artistic inspiration, is unconscious, and the possessor can give no explanation of how it is done.

#### GENIUS AND MENTAL DISORDER

The belief that there is a correlation between genius and mental disease is very old, and there are many reasons why it should have become widely accepted. There have been insane geniuses, and many more whose behaviour has differed strikingly from that which the average person regards as normal. Indeed, since a genius is by definition mentally abnormal in one sense, it requires only a slight lapse of logic to consider him mentally abnormal in another—i.e., in the sense of insane or at least unstable. Insanity and genius tend to excite a somewhat similar emotional reaction, because they seem to be the result of mental processes which the ordinary man does not share. Galton<sup>12</sup> himself thought that "there is a large residuum of evidence which points to a painfully close relation between the two, and," he went on, "I must add that my own later observations have tended in the same direction, for I have been surprised at finding how often insanity or idiocy has appeared among the near relations of exceptionally able men." But only statistical evidence can settle this question. Havelock Ellis,<sup>7</sup> counting every reported case of insanity, including senile disorders, among 1030 British men of genius, found an incidence of only 4.2%, while less than 2% were reported to have had insane parents or children. The incidence is significantly higher among poets, yet among 150 poets born since 1700, and included in the *Oxford Book of English Verse*, only 22 (about 15%) are known to have been either insane or so grossly psychopathic as to be seriously neurotic or opium or alcohol addicts. In spite of this, poetry is not a dangerous trade. On the contrary, Mr. Harold Nicolson<sup>17</sup> has drawn attention to the longevity of the 32 most famous British poets who flourished between the middle of the fourteenth and the middle of the nineteenth century, 19 of whom lived beyond the age of sixty and 10 beyond seventy. I have carried this investigation further by taking 150 poets born between 1700 and 1862 whose work is represented in the *Oxford Book of English Verse*. Their average age at death was seventy: 32 lived to between sixty and seventy, 33 to between seventy and eighty, 27 to between eighty and ninety, and 2 were over ninety when they died. So far as can be ascertained, the longevity of poets does not differ significantly from that of the general population.

Mr. Nicolson<sup>17</sup> has recently defended the mental health of authors. True, some of them may have been eccentric, but few have been actually insane. Apart from these, their peculiarities are not symptoms of mental disorder. "Of course," he says, "all creative writers are nervous; even Horace, that complacent hedonist, referred to them as the '*genus irritabile vatium*'—that tetchy breed of bards"; but to be nervous, even to be extremely nervous, does not necessarily imply that one is suffering from a nervous disease."

‡ In those rare individuals in whom music causes epileptic attacks the emotional response to music appears to be abnormal and to precede the attack. (See Shaw, D., Hill, D. *J. Neurol. Neurosurg. Psychiatol.* 1947, 10, 107.)

*"Nervousness"*

Mr. Nicolson defines "creative writers" as those who "by the force of their imagination, or the delicacy of their perception . . . have discovered new combinations of experience," and he adds that "the creative writer, the poet, and the artist do . . . possess a certain special nervous sensibility, which manifests itself not merely in their receptivity to inspiration but also in certain, apparently morbid eccentricities." Goethe<sup>4</sup> held similar views but drew a different conclusion from them. Speaking to Eckermann about poets he said:

"Their extraordinary achievements presuppose a very delicate organisation which makes them susceptible to unusual emotions and capable of hearing celestial voices. Such an organisation in conflict with the world and the elements is easily disturbed and injured; he who does not, like Voltaire, combine with great sensibility an equally uncommon toughness is liable to constant illness."

Is "nervous" in Mr. Nicolson's sense the same as "neurotic"? If we ask what is meant by "neurotic" we are faced at once by the chaotic state of psychological thought. Psychiatrists use the term in at least four different ways: (1) to indicate a failure to adapt to life owing to certain psychological defects; (2) to describe various abnormal symptoms; (3) for many different theoretical accounts of the psychological causation of (1) or (2); and (4) genetically, to indicate an inherited basis for the tendency to develop the condition explained by (1), (2), or (3).

Eysenck<sup>8</sup> in his recent statistical study finds that the characteristics of neurotic introverts include anxiety, depression, obsessional tendencies, and irritability. According to their own statements their feelings are easily hurt, and they are self-conscious, moody, and given to day-dreaming. He distinguishes a factor for neuroticism from a factor for introversion, the former operating in the (conative) sphere of will and activity and the latter in the (affective) sphere of feeling. Let us leave on one side the question whether the symptoms enumerated are due to the introversion alone or to the combination of introversion and neuroticism.

Is there any difference between Mr. Nicolson's "nervous" creative writer and Dr. Eysenck's neurotic introvert, except that the former possesses higher intelligence and powers of expression? Given this intellectual equipment and sufficient drive, the writer's sensitive feelings and his moods provide the raw materials upon which his self-consciousness directs his analytical thought. His day-dreaming becomes imagination, his obsessions ever and again turn his eyes upon those dark places of the mind from which the normal man averts his gaze, and the flame of his words distils from his experience the quintessence of his raptures and his agonies. So I suggest that those traits which Mr. Nicolson calls "nervous" in the genius are genetically and psychogenetically identical with those which we term neurotic in the ordinary man.

#### CYCLOTHYMIA

The form of insanity which is most closely related to genius is cyclothymia, the manic-depressive state. Many men of genius have either been cyclothymes themselves or have been cycloids with a family history of cyclothymia. Three poets born in the eighteenth century—Smart,<sup>§</sup> Cowper, and Clare—were cyclothymes who were periodically insane. Other noted cyclothymes were James Boswell, George Fox, the founder of Quakerism, Goethe, Robert Mayer, who discovered the law of conservation of energy, and Hugo Wolf, the composer. Isaac Newton<sup>22</sup> at the age of 50 suffered from a mental disorder characterised by depression and delusions. Dr. Johnson was racked by obsessions and

compulsions, but his recurrent depression suggests that he may also have been a cyclothyme. Dickens manifested some obsessional traits, but his general mood of elation, associated with hyperactivity and broken by short recurrent periods of depression,<sup>||</sup> suggests that he too was cycloid.

No man is a genius because he is a cyclothyme, but the association of cyclothymia with the intellectual equipment of genius modifies in a distinctive way the character and the creations of genius. Several such effects may be noted. The creativeness of the genius may show a rhythm determined by the cyclothymia, cycles of productiveness alternating with cycles of sterility. This has been traced in the life of Goethe by Möbius,<sup>¶</sup> who believes that it illuminates even his love affairs, and applied to musical compositions in the case of Hugo Wolf.<sup>18</sup> Secondly, the untiring energy and flight of ideas of the phase of elation may persist as a milder enduring state without disorder of thought, and add greatly to the productivity of the artist, as was the case with Dickens. Moreover, the cyclothyme often possesses a rich endowment of feeling which sharpens his sensibility to nature and to personal relationships, and contributes a characteristic zest to his work. Finally, the extroversion of the cyclothyme enables him to speak to the ordinary man, whereas the introversion of the schizothyme makes his ideas so personal as to be in extreme cases unintelligible.

#### CONCLUSIONS

To sum up, I have presented the view that genius is usually the resultant of several factors. Intelligence is doubtless the most important, and this is the distinguishing feature of those families in which great ability is transmitted through successive generations, often manifesting itself in a wide range of achievements.<sup>23</sup> This is what Dr. Johnson<sup>19</sup> meant when he said: "The true genius is a mind of large general powers, accidentally determined to some particular direction." But there is reason to think that there are specific abilities distinct from intelligence which, when associated with it, decide the character of genius. Power of verbal expression is one such talent, and musical ability is another. Probably many factors are concerned, and it is the uniqueness of particularly favourable combinations that makes the genius.

Most geniuses are perfectly sane, but among creative artists especially the predominant rôle of the feelings explains the closer correlation between genius and mental instability. Here those very traits which in the less intelligent prove a social handicap may, when linked with high intellectual capacity and powers of artistic expression, become a social value, for in the social balance-sheet of genius the deficiencies of the individual may be the assets of society. Is there not sometimes an overlap between the psychopath and the saint, the pervert and the reformer, which makes it impossible to distinguish them by current psychology? The obsessional scrupulosity of John Woolman helped to liberate the slaves, and Charles Dickens's "morbid" preoccupation with cruelty and prisons moved his "normal" fellow countrymen to abolish abuses which their own insensitiveness had long tolerated. Who can say whether Donne, Swift, Boswell, Johnson, Shelley, Darwin, Dickens, and Ruskin would have been of more or less value to the world without their psychological handicaps? And would human culture be the richer or the poorer without its obsessionals and its cyclothymes? Is Mr. Edmund Wilson<sup>25</sup> right when he likens such geniuses to Philoctetes in Sophocles's play of that name?

"The victim of a malodorous disease which renders him abhorrent to society and periodically degrades him

<sup>||</sup> See Charles Dickens's Letters. The Nonesuch Dickens, vol. 1, p. 791; vol. II, pp. 17, 24, 169.

<sup>¶</sup> Quoted by Kretschmer.<sup>14</sup>

<sup>§</sup> See Brain, W. R. *Medical Bookman and Historian*, 1948 (in the press).



and makes him helpless is also the master of a super-human art which everybody has to respect and which the normal man feels he needs. . . . The bow would be useless without Philoctetes himself. It is in the nature of things—of this world—where the divine and the human fuse—that they cannot have the irresistible weapon without its loathsome owner."

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## FUNCTION OF THE CRUCIATE LIGAMENTS OF THE KNEE-JOINT

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It has been the considered opinion of anatomists and clinicians that the cruciate ligaments directly control the anteroposterior stability of the knee-joint. This view follows primarily on the fact that, if these ligaments are torn, the knee-joint is weak in these directions. On this basis the only reasonable method of treatment seems to be the operative replacement of the ligaments.

The object of this paper is to suggest that the cruciate ligaments act not as stays which prevent displacement but as guide ropes during rotation at the knee-joint. Simple extra-articular tendon transpositions make it possible to replace the function of the ligaments without replacing them anatomically. This function explains how a displaced "bucket-handle" tear can lock the knee-joint, and why after this incident the knee gradually straightens itself, even if the displacement is not reduced.

The movement controlled is rotation of the tibia on the femur. This normally takes place in the last 30–40° of extension and in the final degrees of flexion. The tibia here follows the course set by the configuration of the medial condyle of the femur (fig. 1). The cruciate ligaments play the part of the shaft in the ancient water-wheel. The latter is pulled by a blindfolded donkey, which is kept by the shaft on a constant path. If one examines a dissected knee-joint, from which all except the ligaments has been removed, it is clear that the cruciate ligaments guide the rotation of the tibia in a set path. The tension of the anterior cruciate ligament remains constant, as the tibia winds its way forward. If, however, one attempts to extend the knee-joint without allowing rotation—i.e., if one resists rotation while allowing extension—the anterior cruciate ligament becomes tense and hooks over the edge of the inner condyle of the femur (fig. 2). This point is

important and will be referred to again. Therefore it is only when the tibia cannot rotate on the femur that the cruciate ligament can be stretched or torn.

The posterior cruciate runs in an opposite direction in two planes. It appears to control rotation when the knee is fully flexed. During a normal movement of this type it retains normal tension; but, if a direct backward movement—without rotation is attempted, it in turn becomes taut.

## RUPTURE OF CRUCIATE LIGAMENTS

Rupture of a cruciate ligament is therefore produced by forced flexion and extension of the knee-joint without synchronous rotation of the tibia on the femur. In other words, if the foot and hip are fixed and the knee is then forcibly extended or flexed, the cruciate ligament must give way. Similarly, if the tibia is rotated laterally while the knee is flexed, or rotated medially during extension, the injury would be exaggerated. The former method is often described by a sufferer from a torn medial semilunar cartilage or ruptured cruciate ligaments. His foot is twisted outwards while he is falling.

It was pointed out to me by Mr. W. R. D. Mitchell that the extensors of the knee-joint all run slightly medially in their downward course. They are therefore accessories to the anterior cruciate ligament in rotating the tibia in extension. Similarly the flexors, especially the semimembranosus and the popliteus, tend to do the opposite. They act with the posterior cruciate ligament during flexion.

It is rare to find an isolated rupture of the cruciate ligaments. This lesion, nearly always, is associated with a tear or laxity of the medial collateral ligament. Since the medial ligament is fan-shaped, and part of the fan is taut in every position of the knee-joint, the anteroposterior laxity is probably due in part, if not chiefly, to rupture or weakness of this ligament. It is improbable that one would find much anteroposterior laxity in any knee in which the medial ligament is intact. In every knee which I have examined specifically for laxity, when the finding is positive the medial ligament has always been weak.

In a lax knee, due to torn cruciate ligaments and a weak medial ligament, anteroposterior glide can easily be demonstrated when the knee is straight. If, however, the tibia is first passively rotated laterally on the femur—i.e., it is screwed home on the femur—anteroposterior laxity can no longer be elicited. This point tends to confirm that the cruciate ligaments do not directly prevent anteroposterior instability, and suggests that the knee would be stable if the patient would achieve firm lateral rotation when the knee is straightened.

The semilunar cartilages play a part in rotation at the knee-joint. They are attached to the tibia, and the anterior horn of the medial semilunar cartilage is intimately connected with the anterior cruciate ligament.

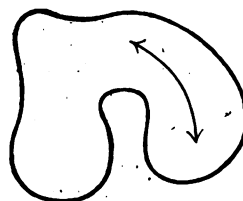


Fig. 1



Fig. 2

Fig. 1—Articular surface of femur showing curved track along which tibia rotates on femur in flexion and extension of knee-joint.

Fig. 2—Arrow shows point at which anterior cruciate ligament hooks over medial condyle of femur if rotation is prevented during extension. Recurrent or long-standing locking of knee-joint causes erosion of articular cartilage there and inflammation of corresponding part of cruciate ligament. Note loss of correct alignment of femur and tibia.

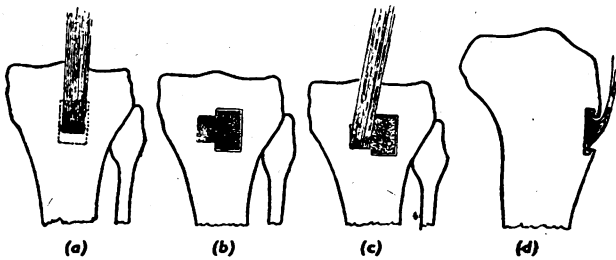


Fig. 3—Stages of transplantation of tibial tubercle by Mitchell's "slot" method: (a) removal of tubercle; (b) gutter to receive tubercle; (c) tubercle transplanted; (d) slot.

They are injured probably in the same way as the cruciate ligaments, but the cruciate ligaments are probably torn by a force of more power or greater range. This would explain the frequent association of a ruptured medial cartilage and a tear of the anterior cruciate ligament. Conversely, if a cartilage is fixed at any point so that it cannot glide normally with the tibia, the whole rotating action of the knee-joint will be out of gear. It is in this way that a dislocated meniscus locks the knee-joint. Extension of the joint is blocked, but it is really rotation that is prevented. A simple test confirms this point. Fix the femur by sitting a patient with his legs over the edge of a table. When the normal knee is extended, the tibial tubercle moves at least  $\frac{1}{2}$  in. outwards. In a knee locked by a dislocated medial semilunar cartilage the tubercle does not move laterally at all. At operation a similar observation can be made. Through the usual medial incision, with the knee bent over the end of a table, the lateral rotation of the tibia during extension shows very well; but, if a "bucket-handle" tear is dislocated across the joint, the tibia does not rotate. Again, if one puts a sterile rubber catheter across the joint in the line the dislocated part of the cartilage would take, the tibia does not rotate. It appears to crowd the space between the anterior cruciate ligament and the internal condyle of the femur, and so blocks this movement.

When the locked knee is extended, the cruciate ligament impinges on the edge of the internal condyle of the femur (fig. 2). If the patient has given a history of repeated locking of the knee, there is an area of erosion of articular cartilage at this point. Sometimes the articular cartilage is completely worn away over an oval area with a longitudinal diameter of about  $\frac{1}{2}$  in. I have seen this lesion described as osteochondritis, but it is really a mechanical erosion of the articular cartilage. In the same knee the cruciate ligament would show injury. The part that has suffered repeated traumata against the condyle is raw and red, and the synovial covering has been superseded by granulation tissue. In this knee too the anterior cruciate ligament is stretched and there is clinical anteroposterior laxity. It must be that, at each locking, attempted extension of the knee-joint stretches the ligament across the medial condyle, with consequent slow lengthening.

To repeat, the cruciate ligament may be ruptured by forced extension or flexion of the knee-joint, if synchronous and appropriate rotation is prevented. There may be an associated injury to the medial semilunar cartilage. On the other hand, repeated locking by a ruptured medial cartilage may stretch the cruciate ligaments and produce anteroposterior laxity of the joint. This latter injury is rarely severe and may always be compensated by increasing quadriceps tone.

#### TEST FOR A DISLOCATED "BUCKET-HANDLE" CARTILAGE

Since this dislocation prevents rotation or screwing-home of the tibia on the femur during terminal extension, when the limit of movement has been reached, the tibia and femur will not be in correct alignment. If,

therefore, the examining finger follows the upward course of the subcutaneous surface of the tibia, when it reaches the knee-joint it will be obstructed by the protrusion of the medial condyle of the femur. This will distinguish the dislocated cartilage from other lesions which prevent extension of the knee-joint, such as effusion, swelling of the fat-pad, &c., and it explains the gradual straightening of a locked knee when not reduced. It is effected by slow stretching of the cruciate ligaments, and extension is recovered without rotation of the tibia. The edge of the medial femoral condyle therefore overhangs the upper border of the tibia. This gives us a simple test for the old dislocated meniscus.

The test is useful in the acute stage as an index of reduction in the presence of effusion, and in the chronic stage in a rather lax knee as a sign that the meniscus is dislocated across the joint. After a knee-joint has suffered an internal derangement due to the slipping of a torn cartilage, it takes some three or four weeks of conservative treatment before all acute signs, such as effusion, tenderness of the joint line, and limitation of movement, disappear. If then the displaced portion of the cartilage is well tucked away in the intercondylar fossa, one would not be able to elicit even the McMurray "click." It is in this knee that the absence of rotation during extension and especially the protrusion of the



Fig. 4

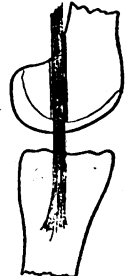


Fig. 5

Fig. 4—Groove in medial condyle for reception of semitendinosus tendon. Fig. 5—Semitendinosus tendon transplanted.

inner femoral condyle at full extension are most helpful in diagnosis, and, indeed, fairly accurate.

#### TREATMENT OF RUPTURE OF CRUCIATE LIGAMENTS

Instability in the knee with torn cruciate ligaments is felt during movement while weight-bearing. The tibia leaves the femur by coming straight forward instead of following the natural curve of the articular surface of the medial femoral condyle. One of my patients could demonstrate this in slow motion. He could subluxate his knee by rotating the femur laterally during flexion. This is an exaggeration of the normal procedure. In other words, the tibia left the femur behind. Others feel the weakness if the tibia does not rotate laterally in extension. It is therefore possible to compensate for these two factors by extra-articular tendon transpositions, as follows: (1) The tibial tubercle is transplanted to the medial surface of the tibia as for a recurrent dislocation of the patella. This increases the lateral rotation of the tibia when the quadriceps straightens the leg. (2) The semitendinosus tendon is slung into a groove in the medial femoral condyle in the line of the medial ligament. This tends to rotate the femur internally when the knee is flexed. The effect can be increased by teaching the patient consciously to contract his hamstrings during normal flexion of the knee in walking. It soon becomes a habit. The insertion of the semitendinosus is not disturbed, and the operation therefore also reinforces the medial ligament. Part of the stabilising effect is probably so produced.

(1) *Tibial Tubercle Transplant.*—Any of the methods of transplanting the tibial tubercle may be used. I prefer

"slot" type of operation, first described to me by Mr. Mitchell. An oblong of tibial tubercle, which includes the insertion of the patellar tendon and about  $\frac{1}{2}$  in. of cortical plate proximally and distally, is removed. A gutter the width of the insertion of the patellar tendon is then cut transversely in the cortex of the inner surface of the tibia. It is undercut by scooping out cancellous bone, above and below, until there is sufficient space to slide the tibial tubercle underneath (fig. 3). This operation has the advantage that no internal fixation is required, and yet early postoperative movement may be instituted, for tension tends to tighten rather than dislodge.

(2) *Transposition of Semitendinosus Tendon.*—With the knee almost straight, an adequate incision is made in the line of the medial ligament. The semitendinosus is defined and mobilised into the wound by bringing it forward between the bone and the tendons of the semimembranosus, gracilis, and sartorius muscles. In the line of its insertion, and therefore in the line of the main fibres of the medial ligament, a groove is cut in the femur (fig. 4). The groove should extend from the upper border of the inner femoral condyle to the reflexion of the synovium of the knee-joint. Distally it should slope inwards and backwards, for then there will be no tendency for the tendon to dislocate. The natural curve of the inner femoral condyle allows the tendon a smooth path in a groove with maximal depth at its centre (fig. 5). The tendon can be slipped into the groove more easily by slightly flexing the knee.

This operation differs from the reconstruction of the internal lateral ligament described by McMurray in that the tendon is allowed to run free. On one occasion I decided to do the tibial tubercle transplant at a second operation. At that time, six weeks after the tendon transposition, the semitendinosus was seen to move sweetly in a smooth well-lined groove.

After operation the knee is kept in a splint for four weeks, but quadriceps and hamstrings drill is instituted after a few days. When movement is allowed, the patient is taught to contract the hamstrings consciously when flexing. This soon becomes a habit. Movement is recovered rapidly. Weight-bearing is permitted after six weeks.

#### RESULTS

I have now used this method on five patients. All have increased in active stability and in confidence. When examined at rest, abnormal movement is as extensive as before, but knee control and stability in walking up and down stairs and on rough ground has improved most satisfactorily.

Mr. Mitchell tells me that he is satisfied with the results in the first two patients he has treated by this method. Both had increased stability and more confident gait. The anteroposterior glide was still present three months after operation. He also tells me of a patient who found his own stabilising gait. Before weight-bearing he placed his foot on the ground in lateral rotation. When weight was taken, the foot was fixed with the hip in lateral rotation, and he could then rotate the femur medially on the tibia, so gaining stability. When, after five months of stumbling and falling, he discovered this trick movement he refused further treatment.

#### SUMMARY

It is suggested that the cruciate ligaments act as guide ropes rather than check ropes. Rotation of the tibia on the femur is the movement controlled.

In the unstable knee the cruciate ligaments and at least part of the medial ligament are torn.

Loss of stability due to tears of these ligaments may be compensated by extra-articular tendon transpositions.

A dislocated "bucket-handle" cartilage prevents final "screwing-home" of the knee-joint in extension, thus leaving the medial femoral condyle protruding over the line of the tibia when the knee is straight. This gives a simple and accurate clinical sign for the displaced cartilage.

## ALEUDRINE AND ANTHISAN IN BRONCHIAL SPASM

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THE clinical effects of an anti-asthmatic drug are difficult to judge. Innumerable drugs have been warmly recommended, and often a high percentage of "cures" has been claimed; but many of these observations rely only on reports by patients, and every experienced clinician knows how suggestible asthmatic patients may be. If one must rely on patients' reports, the patients should be tested for reliability beforehand. Only if they report correctly on the absence of effects after tablets or inhalants known to be ineffective, and only if they have considerable experience in the variability of their own attacks, can they be regarded as reliable. But their reports cannot take the place of an exact estimation.

The only practicable objective measurement is the vital capacity, which is very sensitive to bronchial spasm. There are, however, sources of error. For instance, the degree of bronchial spasm is not constant, and the stronger the spasm the greater is the effect of the anti-spasmodic drug. If the spasm is very slight and the vital capacity is reduced only a little, the same amount of drug may have no effect or a very small one. There can therefore be no constant condition as a basis for the investigation.

Another disadvantage is that emotional factors may influence the bronchial spasm at the same time. In suggestible patients the initial action of an effective antispasmodic restores confidence and this may cut short the attack; this confidence sometimes enhances, even doubles, the antispasmodic action of the drug. In our experiments the respiratory tracings were taken under the influence of substances believed to be effective and of others known to be ineffective. In a number of cases patients reported relief from an ineffective substance, but in all of them the vital capacity remained unchanged. It may, therefore, be regarded as a reliable guide to the degree of bronchial spasm (Curry 1946).

#### ALEUDRINE

'Aleudrine' is isopropyladrenaline, a synthetic adrenaline that may be taken as tablets, each containing 0.02 g., perlingually or as atomised spray in 1% or stronger solution. The effect of perlingual administration begins after 4-10 min.; with the spray the action is immediate. The effect is almost as dramatic as with adrenaline. The dosage varies as with adrenaline—i.e., for a patient who would require min. 20 of adrenaline about 0.04 g. of aleudrine will be needed, but this relation is only very approximate and not valid for every patient. As with adrenaline, the full dose must be given all at once—it is useless to take one tablet of aleudrine after another. If inhalation is used, the stronger solution should be substituted if the weaker proves ineffective after a minute.

Unpleasant side-effects of aleudrine are rare and slight, being much less frequent than with adrenaline. The only ones I have observed were palpitations. In one of these rare cases inhalation of 5% adrenaline also produced a severe general adrenaline effect after 2 min., with pallor and sweating, lasting 15 min. The same patient never had, either before or since, similar symptoms with an equal or higher dosage.

Table 1 lists the effects obtained in all the patients tested with aleudrine.

*General Efficiency.*—Aleudrine caused an increase of vital capacity in 29 of the 31 cases. Case 26, given the 5% inhalation only, probably did not inhale long enough to show an effect; and in case 30 as well as in some

TABLE I—RESULTS OBTAINED WITH ALEUDRINE

Case no.	Age (yr.)	Type of bronchial spasm	Length of history	Vital capacity expected from weight (c.cm.)	Vital capacity before administration* (c.cm.)	Vital capacity after administration* (c.cm.)					Perilngual (dose in g.)
						Inhalation					
						1 %	1 % + 1 % papav.	3 %	5 %	1 % papav.	
1	20	Rare, slight .. ..	15 yr.	2630	2715	..	..	..	3010	..	..
2	22	Rare, with long free intervals	Several years	3425	3230	..	..	..	4900	..	..
3	20	" " " ..	Since childhood	2100	2495	..	..	..	..	..	(0-03) 2790
4	19	Rare, very slight .. ..	Many years	3400	5310	..	5535	..	..	..	..
5	24	Severe, short intervals ..	"	3550	3795 1050 2770 1340	.. .. .. ..	.. .. .. ..	3950	..	..	(0-04) 3955 (0-02) 1320 (0-06†) 2935 (0-025) 3750 3850‡
6	17	Long, during summer ..	Since childhood	3620	1980	..	..	2560	..	..	(0-02) 3020
7	16	Emphysema, asthmatic state	"	2720	2435 2900 2200	.. .. ..	2680	..	..	..	(0-05) 3060 (0-04) 3180 (0-05) 2590
8	22	Frequent slight attacks ..	"	2970	3675	..	3925	..	..	..	..
9	16	Emphysema, asthmatic state	"	2650	1440 1750 1060 1170 1320 2735	.. .. .. .. .. ..	2190	..	2260 2140§	..	(0-035) 2210 (0-04) 2800 (0-03) 1680 (0-02) 1700 (0-03) 2740
10	35	Slight, but long-lasting attacks, with long free intervals	8 yr.	2730	2580 2235	.. ..	2450	..	..	..	(0-02) 2560 (0-04) 2890
11	28	Subasthmatic state .. ..	7 yr.	2300	2700 ..	.. ..	2700 2110 2700	..	..	..	(0-05) 2720 (0-02) 2705
12	28	Asthmatic state .. ..	12 yr.	3230 Obese	1665 2160 2320 2320 2550 2635 2260 1510	2135 .. 2480	2460 2600	..	..	2350	(0-03) 2360 .. .. .. (0-025) 2590 (0-035) 2575 (0-02) 2530 (0-02) 2480
13	34	Attacks lasting all summer	2 yr.	2570	1950 1780 1510 2195 2060	2135 .. 2020	2430 2620	..	..	..	(0-025) 2570 .. .. (0-05) 2660 (0-03) 2305
14	14	Slight frequent attacks ..	10 yr.	2440	2215 2090	.. ..	2270	..	..	..	(0-02) 2605 (0-03) 2490
15	24	Slight frequent attacks with short free intervals	Since childhood	3440	3900	..	..	..	4140	..	..
16	15	Subasthmatic state .. ..	"	2710	2430	..	..	2885	..	2360	..
17	36	" " " ..	7 yr.	2860	1700	..	..	..	..	..	(0-04) 2260
18	23	Emphysema .. ..	4 yr.	2080	1890 1970	.. ..	..	2200	..	2110	(0-03) 2115
19	14	Asthmatic state .. ..	Since childhood	2260	2060	..	..	..	..	..	(0-02) 2335
20	27	" " " .. ..	"	ca. 2800	2750	..	..	..	..	..	(0-03) 3250
21	58	Emphysema .. ..	Several years	3390	2940 2870	.. ..	..	..	..	..	(0-02) 3060 (0-06) 3130
22	53	" " " .. ..	4 yr.	3480	1920	..	..	..	..	..	(0-06) 2270
23	45	" " " .. ..	4 yr.	3160	2490	..	2450	..	..	..	(0-06) 2810
24	30	Severe asthmatic state without any free intervals	8 yr.	3572	2435	..	..	..	..	..	(0-05) 2675.1
25	28	Asthmatic state and emphysema	5 yr.	4330	4010	..	..	..	4840	..	..
26	66	Emphysema .. ..	7 yr.	3910	2980	..	..	..	2895	..	..
27	47	" " " .. ..	11 yr.	2700	2310 1860	.. ..	..	..	2520	..	(0-06) 2180
28	46	Bronchiectasis and emphysema	10 yr.	3300	2580	..	..	..	..	..	(0-08) 3060
29	63	Emphysema .. ..	10 yr.	ca. 3350	1720 1520 1490 1700	.. .. .. ..	..	1900	1840 1740 1900	1755	(0-04) 1980
30	44	Bronchitis and emphysema	Many years	3220	3015	..	..	..	..	..	(0-03) 3115
31	18	Moderate asthma .. ..	Since childhood	2690	2140	..	..	2625	..	..	..

\* The values for vital capacity given in tables I and II are the means of three determinations made in the same tracing and lying within a total range of 150 c.cm. † This dose was given 20 min. after the previous one (0.02 g.). ‡ Believed to be partly a psychological effect. § 1% papaverine added. || Side symptoms developed.

experiments on cases 9, 10, 11, and 12 the vital capacity had obviously reached its maximum before the experiment, thus rendering any antispasmodic drug ineffective. Where the vital capacity is decreased before the test, aleudrine raises it; where it is near its maximum, no further increase takes place.

*Dosage varies widely.* On the whole, the younger the patient and the shorter the history, the smaller is the dose needed. A middle-aged patient with a short history will probably require less than a young one with a long history. Elderly emphysematous patients nearly always require higher doses. The 1% inhalation proved effective in the comparatively few cases in which it was tried, but the optimal effect was seldom reached. If it was combined with 1% papaverine hydrochloride the effect was stronger (cases 12 and 13) and the optimal increase was often reached; 1% papaverine alone sometimes had a limited effect (cases 12 and 18), sometimes none (cases 12, 16, and 29). The 3% and 5% inhalations of aleudrine usually had the fullest effect that could be achieved. In perlingual application doses of 0.02 g. and 0.03 g. were often too small to produce the optimal increase (cases 5 and 9). In emphysematous patients doses smaller than 0.04 g. are rarely of any value. Doses of 0.06 g. or more carry the risk of side-effects.

*Different Effects on Different Vital Capacities.*—On the whole, the lower the vital capacity to start with, the greater the action of aleudrine. This does not hold for emphysematous patients with greatly reduced vital capacity. It seems that in these cases the vital capacity cannot be raised to the expected value by any dosage. Often 200–300 c.cm. is the only increase that can be achieved, whatever the initial capacity (cases 22, 23, 24, 27, 28, and 29).

*Tolerance.*—The development of tolerance to a dose given thrice daily was investigated in 5 patients.

Of these, 2 were in a moderate status asthmaticus with a constant reduction of vital capacity. Their vital capacity increased after their daily doses of aleudrine during the first two days; on the third day the increase was slightly less; and on the fourth day it was so small that it lay within the margin of error.

A third patient had severe attacks twice or thrice in twenty-four hours which could be checked with adrenaline or with 0.04 g. of aleudrine. On 0.04 g. of aleudrine thrice daily he remained free for thirty-six hours; then an attack developed which was not completely checked with 0.04 g. of aleudrine. On the third day another attack developed, and the experiment was then stopped.

The last 2 patients had a long history of severe asthma but had improved so much that their vital capacity was normal and their frequent attacks were slight and easily controlled by inhalation. In both, asthmatic attacks were produced with histamine (in one of them by inhalation of 1% histamine acid phosphatase, in the other by subcutaneous injection of 1 mg. of the same substance), which reduced the vital capacity by about a third. Aleudrine 0.02 g., given immediately afterwards, restored the vital capacity to the former normal value. The same dose of aleudrine was now continued thrice daily for six days, and no reduction of its efficacy could be noticed in the histamine test done on the third, fourth, and sixth days.

It appears, therefore, that in the first 3 patients tolerance was acquired, but not in the last 2. The conditions leading to tolerance will require further investigation.

#### ANTHISAN

'Anthisan' is pyranisamine maleate ('Neoantergan'), one of the strongest anti-histamine substances so far described. I have made only a few observations on anthisan, but these are included here for comparison with those obtained with aleudrine.

Anthisan has been given by mouth and by inhalation. Unfortunately, inhalation causes a cough in many patients which makes the treatment very difficult. This cough is overcome after 1–3 min. Apparently some anaesthesia develops in the air-passages (Dews and

TABLE II—RESULTS OBTAINED WITH ANTHISAN

Case no.	Age (yr.)	Type of bronchial spasm	Length of history	Vital capacity expected from weight (c.cm.)	Vital capacity (c.cm.)		
					Before	After 10% anthisan inhalation	After anthisan tablet (dose in g.)
1	16	Emphys. Chronic status asthm.	Since childhood	2650	1870 980 1700	2500 .. ..	(0.4) 1170* (0.3) 2280*
2	16	"	"	2720	2200 2060	2360 ..	(0.4) 2900*
3	53	Emphys.	4 yr.	3480	2055	2330	..
4	28	Status asthm.	5 yr.	4380	3460	3870	..
5	42	Emphys.	8 yr.	3700	2570	..	(0.4) 2835
6	45	"	3 yr.	3160	3050	..	(0.3) 3340
7	14	Slight, frequent	10 yr.	2440	2090	..	(0.3) 2340
8	65	Frequent, short	25 yr.	3515	1830	..	(0.4) 2030
9	42	Emphys.	8 yr.	3025	1670	..	(0.3) 2045
10	15	Moderate	Since childhood	2710	2880	..	(0.3) 3080
11	18	Moderate	"	2690	2140	..	(0.3) 2380
12	54	Emphys.	6 yr.	3660	2830	..	(0.3) 3480
13	25	Chronic bronch., emphys.	Since childhood	2070	2185	..	(0.4) 2820
14	30	Moderate	2 yr.	3740	3710	..	(0.5) 4065

\* Side symptoms developed.

Graham 1946); numbness is felt, and further inhalation does not cause any difficulty.

By inhalation the drug acts at once; by mouth it acts after about an hour. The most pronounced side-effect after administration by mouth is drowsiness, and in some cases nausea develops. Drowsiness can sometimes be effectively countered with caffeine citrate or with amphetamine. The dosage of anthisan varies from 0.1 to 0.6 g. If anthisan is given once a day, tolerance does not seem to develop. Anthisan is most beneficial at night, because it also acts as a narcotic, and its antispasmodic action lasts more than nine hours. Vasomotor rhinitis, often present in asthmatics, disappeared completely in many cases.

Table II includes only the 13 patients whose vital capacity was tested with anthisan. These and a further 28 patients were given anthisan in one dose to be taken at bedtime, and they had to report the effect on their sleep and the attacks during the night.

*General Efficiency.*—There was a definite increase of the vital capacity, but it was not as great as after aleudrine.

Of the 30 patients who took anthisan at bedtime 26 reported that they had slept through the night, whereas before taking anthisan they used to wake up with slight attacks and had to inhale; 4 reported that they had to inhale less often during the night, perhaps twice or thrice instead of six times, and that they slept continuously for four or five hours—i.e., longer than before. The doses taken were 0.05 g. (1 case), 0.1 g. (3 cases), 0.2 g. (15 cases), 0.3 g. (14 cases), 0.4 g. (5 cases), 0.6 g. (2 cases), and 0.7 g. (1 case); 4 patients were slightly nauseated after 0.3–0.6 g. and had to have their doses reduced by 0.1 g. Five patients not included in this series experienced sickness after doses ranging from 0.1 to 0.4 g.; when the dose was reduced, there was no beneficial effect, and anthisan was discontinued; 2 further patients experienced acute diarrhoea and discontinued the drug for this reason; 2 other patients received, besides their evening dose of anthisan, ephedrine gr. 1 in the morning. This combination improved their vital capacity considerably: in a juvenile asthmatic it increased from 1980 to 3745 c.cm., in an emphysematous

patient aged 66, it increased within a week from 1830 to 3500 c.c.m. Altogether, of the 47 patients treated, 7 had to give up the treatment because of untoward symptoms.

**Dosage and Tolerance.**—The variation of the optimal dosage from 0.05 g. to 0.7 g. is remarkable, and in this respect the substance resembles ephedrine.

If anthisan was given only once daily, tolerance did not develop in most patients, though in 3 of them the dose had to be gradually increased by 0.2–0.3 g. In 2 patients anthisan was given thrice daily—0.2 g. in the morning and at midday, and 0.4 g. at night. In both the wheeze was effectively suppressed during the first two days only, during which they were very sleepy. This sleepiness was much less pronounced on the third day and still less on the fourth. On this day the bronchial spasm was of about the same degree as it was before anthisan was given.

This indicates that some tolerance develops at least in some patients; further investigations will be required.

#### DISCUSSION

Aleudrine is no recent discovery. It was described by Kontzett in 1940, and has been increasingly used on the Continent. Some favourable clinical reports (Stolzenberger-Seidel 1940, Quitschal 1942, and others) have appeared. Voegtli and Verzár (1945) have produced accurate data showing subjective and objective improvement after inhalation of 1% aleudrine. It seems surprising that so little note of this has been taken in Britain.

Our experiments confirm the favourable published results. In isopropyladrenaline we possess a substance which has less effect on the circulation and more on the bronchial muscle than adrenaline, can be given perlingually instead of parenterally, and can be inhaled in higher concentrations than adrenaline. It can therefore to a great extent take the place of adrenaline in asthma, and its importance in medical practice can hardly be overrated. It is essential that an asthmatic attack should be interrupted by an antispasmodic drug immediately it starts. This is rarely possible with adrenaline, because it has to be injected. Aleudrine perlingually acts as quickly as adrenaline and can be taken easily, regardless of external circumstances. Unpleasant side-effects are rare and slight, and usually less troublesome than after adrenaline. The drawback is that tolerance may be acquired, but I suspect that this is the same with adrenaline, though this question has not, to my knowledge, been investigated.

The effect of anthisan in asthma has not yet been described,\* though its pharmacological effects are well known (Bovet et al. 1944). Another anti-histamine, 'Benadryl,' seems to have little effect in asthma, though large doses have been described as beneficial (McGavack et al. 1947).

In our experiments anthisan did not have as pronounced an effect in asthma as aleudrine, but it increased the vital capacity consistently and beyond the margin of error. One might be tempted to ascribe the beneficial

effect of anthisan in suppressing nocturnal attacks to its narcotic action, but the same improvement cannot be achieved with barbiturates. Moreover, the antispasmodic effect often extends into the period after waking, and many patients reported that the common "early morning wheeze" disappeared or was much shorter after anthisan. Unfortunately, inhalation has unpleasant side-effects, and if these cannot be overcome, only administration by mouth (apart from injection) will be practicable, and only at night, when the accompanying drowsiness is a desirable side-effect. Tolerance rarely develops if anthisan is given only at night, and its most useful application seems to lie in the suppression of night attacks.

One major difficulty is the unusually wide variation in the individual dosage of anthisan. This makes it impossible to assess its action by giving it to a large group of persons without finding the individual optimum dosage beforehand. No effect would be expected in most cases, and psychological factors would further obscure the result.

The dosage may vary also in the same person. The more severe the attack the higher the dosage needed to overcome it; and if tolerance has developed the dosage will have to be higher still. This holds for all drugs effective in bronchial spasm. Therefore two general principles should be observed:

(1) The optimal dosage should be found by spiographic tracing of the vital capacity. One should avoid giving an arbitrary amount in the hope that it will be right, and one should not rely only on the report of the patient, for he often imagines relief when there is none (this has also been observed by Levy and Seabury 1947), and he will register small degrees of relief as very satisfactory, whereas much greater relief could have been achieved with higher dosage. Determination of the amount of relief by the increase in vital capacity makes it necessary for the patient to attend as a hospital outpatient, except that, when anthisan is given only in the evening, the patient's impression can be used as a guide, because he will report reliably on the quality of his sleep and the presence or absence of spasm.

(2) If a drug is given in three or more daily doses, it should not be continued for more than three or four days, because tolerance may be acquired. Alternatively the dosage must be increased, but it is more useful to discontinue the drug for three days. During this period the tolerance is lost, with the result that the previous dosage can be applied again, as in the case of ephedrine (Herxheimer 1946a). This holds good for ephedrine, and, in some patients, also for anthisan and aleudrine.

It is not yet possible to lay down definite rules for which of the various drugs to choose in an individual case of bronchospasm, but a few facts gained by experience may be mentioned:

If the attacks are rare and slight, and there is no chronic wheeze in the interval, inhalation of aleudrine or of papaverine is often sufficient. If the attacks occur only at night, anthisan is still more convenient.

If the attacks are more violent but still rare, with no wheeze in the interval, perlingual aleudrine or inhalation of strong aleudrine solution should be tried.

If there is slight bronchial spasm in the interval, the effective drug should be continued and, when tolerance is reached, changed to another drug of the group. Experiments on such combinations are in progress.

If there is continuous bronchial spasm with or without violent exacerbations (status asthmaticus), higher doses are usually required. If the condition has persisted for years, ephedrine is usually more effective than any of the other drugs. Inhalation of aleudrine or papaverine will give relief, but this is incomplete and often fleeting. Unfortunately ephedrine is often not tolerated, and in the patients who tolerate it it is always necessary to approach the limit of tolerance.

If it is suspected that the spasm is increased by hyperventilation, inhalation is contra-indicated. In such cases, 6 of which I have described (Herxheimer 1946b), the drug would probably not even balance the effect of hyperventilation.

There are hardly two patients whose type and frequency of asthmatic attacks are similar. The choice and dosage

\* Since this paper was written the paper by Hunter and Dunlop (1948) has come to my notice. Their negative results with anthisan in the treatment of asthma were, I think, mainly due to their small single doses, the largest of which was 0.2 g. (except perhaps in 2 cases). This dose is smaller than those with which I have obtained an increase in vital capacity. Night attacks were prevented in our series with 0.2 g. only in very mild asthma. As far as the severity of their cases can be judged from the description, only 3 or 4 of the 32 cases of Hunter and Dunlop who had 0.2 g. three times daily fall into this mild category. Even these patients sometimes require higher doses; all more severe cases certainly do. Apart from this question of dosage, the three daily doses which they gave over long periods probably produced tolerance in at least some of their patients. I feel, therefore, that since they do not determine the effective individual dosage beforehand, the valuable method of control employed by Hunter and Dunlop does not help them to assess the true value of the drug. Recently, further proof of the efficacy of anthisan has been obtained by its intravenous injection, after which prompt relief and increase of vital capacity were observed, although it had been suggested to the patient that no favourable result could be expected.

of drugs have to be tried out individually, a process that requires much time and patience. When this has been done and the patient has learnt to cope with intercurrent attacks, he need no longer be seen frequently in the outpatient department; one visit in one to three months will suffice. (The procedure is, in principle, similar to that adopted for the control of diabetics.)

In most cases definite improvement can be achieved and patients rendered fit for work who before had been regarded as semi-invalids. This is an aim well worth the effort, especially if one compares the doubtful effect of a long desensitisation course. The treatment may seem to be merely symptomatic, but it resembles rather a substitution therapy, and it should not be neglected in favour of desensitisation.

#### SUMMARY

Aleudrine (isopropyladrenaline) is effective in relieving attacks of bronchial spasm. It can be administered perlingually or inhaled.

The anti-histamine drug, anthisan, is also effective against bronchial spasm.

Tolerance to both substances is acquired by some patients.

The optimal dosages vary widely in different people, and they should be determined in every case by spirometry.

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## PENICILLIN THERAPY IN SCARLET FEVER AND COMPLICATING OTITIS\*

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THE exact grouping and typing of hæmolytic streptococci after Lancefield and Griffith has thrown light on the epidemiology of scarlet fever, especially as regards complications, relapses, and reinfections. Gradually it has been realised that the treatment of scarlet-fever patients in a common ward irrespective of bacillary type, stage of disease, and possible complications is undesirable. Evidence has accumulated to the effect that all so-called relapses are due to reinfection, since the change in type of the infecting organism may be demonstrated immediately before, or simultaneously with, the "relapse." Similarly, many complications are probably due to reinfection, since a change in the type of the pathogenic organism has often been demonstrated in such cases.

As a result of such observations various improvements in the treatment of scarlet-fever patients have lately been suggested—e.g., private wards, type-specific wards, and home treatment. All these suggestions, however, have

encountered practical and economic difficulties. Besides, by adopting such measures it will not always be possible to avoid complications resulting from the primary streptococcal infection—and in previous reports from other countries as well as from Denmark 40–60% of all complications have been attributed to the primary type of streptococcus. Therefore an effort should be made to develop a form of therapy which will rapidly rid the patient of hæmolytic streptococci in the nasopharynx. In this respect the sulphonamide therapy hitherto employed has been disappointing, whereas penicillin soon proved to be most effective.

#### METHODS

In December, 1945, in the Blegdam Hospital we began treating scarlet-fever patients with penicillin. All the patients admitted on one day were given penicillin; and all those admitted next day were given sulphanilamide, and so on alternately. During their first five days in hospital the patients in both groups were all placed in small wards, so that no new patients were admitted to wards where others were already under treatment. On the sixth day the patients had a bath and their bedding was disinfected. Then the penicillin-treated patients were transferred to one "clean" ward and the sulphanilamide-treated patients to another "clean" ward.

#### Dosage

At first, to reduce the number of injections of penicillin as far as possible adrenaline was given with the penicillin—5 ml. of saline containing 0.3 ml. of 1 in 1000 adrenaline per 100,000 units of penicillin—to delay the absorption of penicillin. Deep subcutaneous injections were given just superficial to the muscular fascia on the anterior aspect of the thigh. Children under 1 year received 40,000 units, children aged 1–5 years 60,000 units, children aged 5–15 years 80,000 units, and adults 100,000 units thrice daily for six days. This dosage was used until 200 patients had been treated with penicillin and 200 with sulphanilamide. In a further 18 cases the course of penicillin was cut down to three days, but this was unsatisfactory (see below).

Since Oct. 1, 1946, all scarlet-fever patients admitted to the hospital have been treated with penicillin: 350 patients were given penicillin and adrenaline subcutaneously thrice daily for six days and discharged, on an average, after eight to ten days; and 142 patients were given penicillin (without any adrenaline) intramuscularly twice daily for six days. The dosage was as follows: children under 1 year received 60,000 units; children aged 1–5 years 90,000 units; children aged 5–15 years 120,000 units; and adults 150,000 units at each injection.

*Controls.*—As controls for the first 200 patients treated with penicillin, 200 other scarlet-fever patients were treated for eight days with sulphanilamide.

*Follow-up.*—From Oct. 1, 1946, during the first three weeks after their discharge from hospital all the patients of the uncontrolled series were under observation as outpatients, the following tests being performed every week: cultures for the presence of hæmolytic streptococci, microscopical examination of the urine, electrocardiography, and determination of erythrocyte-sedimentation rate (E.S.R.) and antistreptolysin titre. The 142 patients given intramuscular penicillin without adrenaline were further followed up for eight weeks.

#### RESULTS

*Length of Treatment.*—Since nearly all the penicillin-treated patients in the controlled series became free from streptococci within 24–48 hours, and since penicillin was scarce in Denmark in the early months of 1946, I tried to shorten the period of treatment from six days to three without changing the daily dosage. Altogether 18 patients

\* Read before the 20th Nordic Congress of Internal Medicine, at Göteborg, in June, 1946, and at the 4th International Congress for Microbiology in July, 1947.

were treated in this way, and they all became free from streptococci in less than 48 hours after the start of treatment (fig. 1). After a few days, however, hæmolytic streptococci were found with increasing frequency. Of the 18 patients, 11 were discharged while harbouring streptococci, and complications appeared subsequently in 7 of them (39%): tonsillitis in 3, tonsillitis and adenitis in 1, adenitis in 2, and otitis and mastoiditis in 1. Thus it is evident that the length of treatment is directly related to the results obtained with penicillin in scarlet fever.

**E.S.R. and Antistreptolysin Titre.**—In nearly every case in the controlled series the E.S.R. was estimated and an antistreptolysin test made once a week. The results are given in figs. 2 and 3. The E.S.R. (fig. 2) fell far more rapidly in the patients given penicillin.

INCIDENCE OF MASTOIDECTOMY IN SUPPURATIVE OTITIS MEDIA COMPLICATING SCARLET FEVER

Year	No. of cases of scarlet fever	No. of cases of otitis media	No. of mastoidectomies
1941	1529	266	53 (21%)
1942	2110	227	47 (21%)
1943	2345	195	71 (36%)
1944	2073	178	68 (38%)
1945	1674	125	30 (24%)
1946	1583	65 25*	23 (36%) 2 (8%)
1947 (6 months)	281	31*	0

\* Treated with penicillin.

Fig. 3 shows that the great majority of the penicillin-treated patients did not form any antistreptolysin, no doubt because of the rapid and effective action of penicillin on streptococci. For the same reason the amount of specific antibody formed is small, so it is theoretically possible for reinfection with the same type of streptococcus to take place more easily. This possibility is illustrated by a scarlet-fever patient who was lately readmitted, a month after his discharge, with scarlet fever of the same type as on his first admission. So far as I am aware, no case of relapse or, more correctly, reinfection with a streptococcus of the same type has been published previously.

**Use of Adrenaline.**—In the uncontrolled series it was found that the results of treatment with intramuscular penicillin (without adrenaline) twice daily for six days were just as favourable as those obtained with three daily injections of penicillin and adrenaline for six days. Hitherto it had been thought necessary to maintain, so far as possible, a constant concentration of penicillin in the blood, whether by the use of beeswax or adrenaline, by giving injections every three hours, or with a continuous drip, or by adopting mechanical measures to slow absorption. The present material shows that equally good results can be obtained with only two intramuscular injections of penicillin daily. This makes it possible to simplify the treatment of scarlet fever so that it may be carried out at home, provided the home conditions allow of isolation for two days.

**Complications.**—Fig. 1 shows that, in the controlled series, 73% of the sulphanilamide-treated patients still harboured hæmolytic streptococci at the end of treatment, and 53% on discharge from hospital. Complications appeared in 49.5% of this group. On the other hand, in the penicillin-treated group, only 4% of the patients harboured hæmolytic streptococci at the end of treatment, and complications appeared in

only 5.5%, there being no otitis or nephritis. The complications are analysed as follows:

Complications	200 cases treated with sulphanilamide	200 cases treated with penicillin
Adenitis .. .. .	29.0%	0.5%
Suppurative otitis media .. .	4.0%	0
Secondary tonsillitis .. .	4.0%	2.0%
Secondary rhinitis .. .	9.5%	2.5%
Sinusitis .. .	0.5%	0
Nephritis .. .	1.0%	0
Jaundice .. .	1.0%	0
Myocarditis .. .	0.5%	0.5%
Totals .. .	49.5%	5.5%

In the uncontrolled series, to find how soon the streptococci disappeared from the nasopharyngeal cavity, cultures were made from 32 scarlet-fever patients every four hours day and night. More than half the patients (18 out of 32) were free from hæmolytic streptococci as early as twelve hours after the start of the penicillin treatment, and on the third day all the patients gave negative cultures. The streptococci disappeared from the discharge from the ears just as rapidly without local treatment. The sore throat subsided more rapidly in the penicillin-treated patients. In the penicillin-treated patients the primary temperature lasted on an average 4.5 days, in the sulphanilamide-treated patients on an average 7 days. The rash was not influenced by penicillin.

Up to now we have treated 1000 scarlet-fever patients with penicillin. Nephritis did not develop in any of them (4 were readmitted with albuminuria which proved to be orthostatic). No cases of secondary streptococcal otitis occurred (1 patient had pneumococcal otitis that subsided on renewed treatment with penicillin; and in 1 patient a Pfeiffer's bacillus otitis was found). In 4 patients adenitis appeared after their discharge from hospital, and in 3 of these a different type of streptococcus was found in the throat, wherefore it is reasonable to assume that the lymphadenitis resulted from a reinfection. These 4 patients were again given penicillin therapy, and the adenitis subsided promptly.

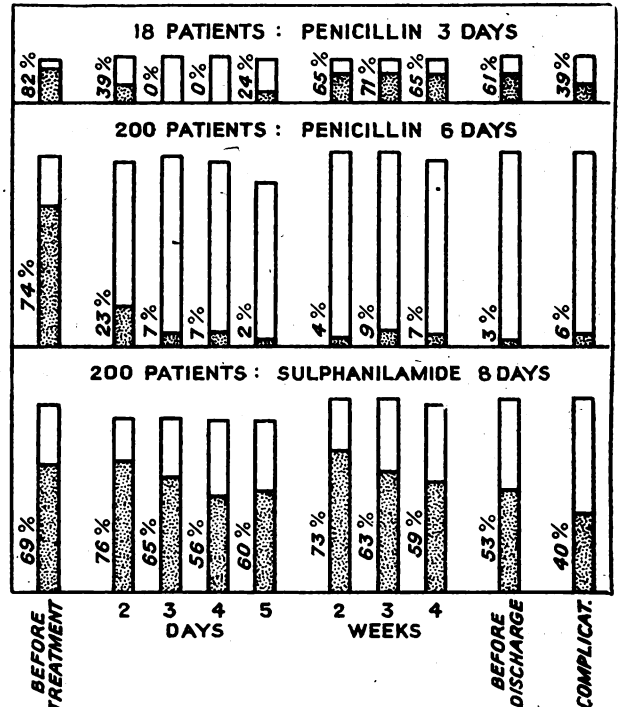


Fig. 1.—Results of tests for presence of hæmolytic streptococci in nasopharynx of scarlet-fever patients treated with penicillin or with sulphanilamide: stippled columns, streptococci present (expressed also by percentages); blank columns, streptococci absent.



Probably one of these patients was reinfected from the mother, who in the past four months had been under otological treatment because of purulent discharge from the nose, resulting from a sinusitis. Cultures from the mother and child repeatedly grew hæmolytic streptococci of the same type. Then the mother was admitted to hospital and treated with penicillin 150,000 units intramuscularly twice daily for eight days. After that no hæmolytic streptococci were seen in the cultures, and the nasal secretion ceased after treatment with penicillin for four days.

OTITIS AND MASTOIDECTOMY

As mentioned already, no instance of hæmolytic streptococcal otitis occurred among the scarlet-fever patients treated promptly with penicillin early in the acute phase; but some patients were admitted with scarlatinal otitis. In 1946, 25 patients with scarlatinal otitis were treated with penicillin, two or three intramuscular injections being given daily, as in the other scarlet-fever patients, except that the treatment was continued longer—six to twenty-three days with an average of

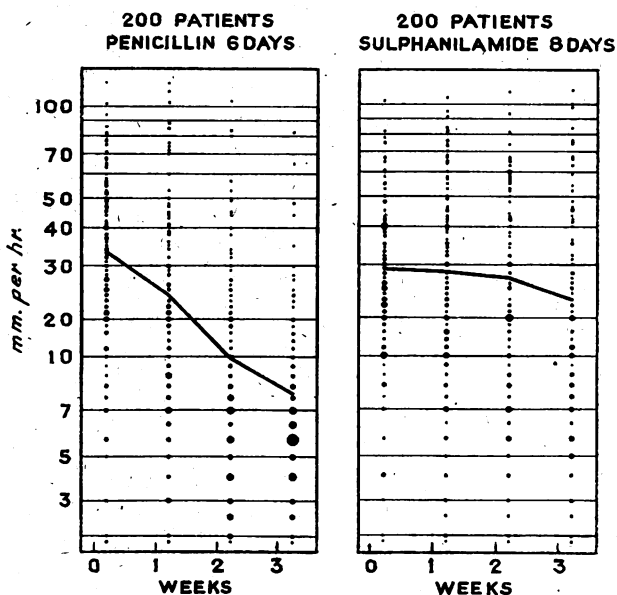


Fig. 2—Erythrocyte-sedimentation rates in scarlet-fever patients treated with penicillin or with sulphanimide. Smallest dots indicate single cases. Larger dots indicate relatively larger number of patients. The mean readings are shown by curves.

nine days. In these patients the otitis had lasted an average of six days before admission (excluding 1 patient, in whom the otorrhœa had persisted for three months).

After the start of penicillin therapy it took, on an average, seven days for the otorrhœa to cease. In nearly all these cases the discharge was free from streptococci as early as the day after the start of penicillin therapy. In only 3 patients could hæmolytic streptococci be demonstrated in the discharge from the ear as late as three days after the start of penicillin treatment.

In the group of scarlet-fever patients treated with penicillin only 2 were submitted to mastoidectomy (in 1 of these a well-marked mastoiditis was already present at the start of penicillin therapy).

During the same period (1946), of 65 patients admitted with scarlatinal otitis and treated with sulphanimide 23 (35%) required mastoidectomy. The hæmolytic streptococci persisted in spite of energetic treatment with sulphanimide.

Since Jan. 1, 1947, all cases (31) of scarlatinal otitis have been treated with penicillin, and none has needed mastoidectomy. On the other hand, in 1941-45, when most of the patients were treated with sulphanimide, mastoidectomy had to be performed in 21-38% of all the cases of scarlatinal otitis (see table).

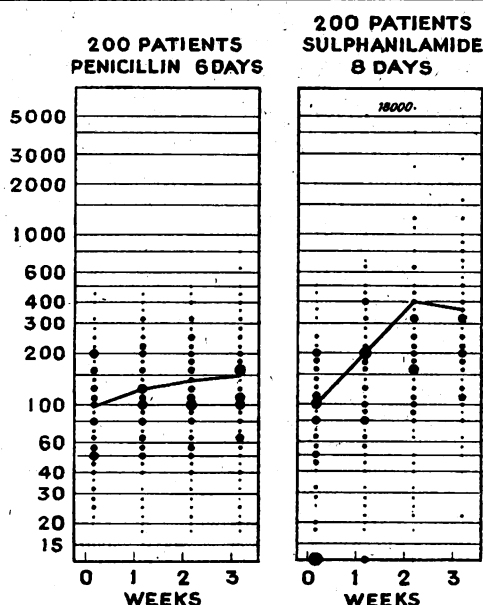


Fig. 3—Antistreptolysin titre in scarlet-fever patients treated with penicillin or with sulphanimide. Dots and curves as in fig. 2.

SUMMARY

Since December, 1945, a total of 1000 patients with scarlet fever have been treated with penicillin in the Blegdam Hospital and followed up carefully.

Intramuscular injection of 90,000-150,000 units of penicillin (according to the patient's age) twice a day will rid the nose and throat of hæmolytic streptococci within 48 hours.

It is unnecessary for this purpose to maintain a bacteriostatic concentration of penicillin in the blood by giving injections three-hourly or by injecting the penicillin with pea-nut oil, wax, adrenaline, &c.

To prevent the reappearance of the streptococci the penicillin treatment should be continued for 6 days.

Under this treatment sore throat subsided rapidly. The average febrile period was only 4.5 days, compared with 7 days in controls treated with sulphanimide. No complications (otitis, nephritis) developed. The average stay in hospital was only 8 days. Accordingly the saving in hospital days was very great (in Denmark it has been estimated to be about 300,000 days a year, with an average annual scarlet-fever morbidity of 14,000 cases).

The reduction of injections to two daily makes home treatment possible where conditions allow the patient to be isolated for a few days.

The rash of scarlet fever is not influenced by the treatment.

In the patients admitted with a streptococcal otitis treatment with penicillin in the same dosage gave very good results. In 1941-45, in spite of energetic treatment with sulphanimide, 21-38% of patients with scarlatinal otitis had to undergo mastoidectomy. With penicillin therapy, of 56 patients admitted with scarlatinal otitis only 2 required mastoidectomy, and in 1 of these mastoiditis was already present at the start of penicillin treatment.

ADDENDUM

Since this paper was submitted for publication a total of 2000 scarlet-fever patients have been treated with penicillin. No change has been made in the dosage (90,000-150,000 units twice a day for 6 days). The patients have been discharged from the hospital on an average 8 days after admission. The results of treatment have been just as favourable in these later cases as in the earlier ones. On follow-up examination of the penicillin-treated scarlatinal patients, none of them has been found to have any complication in the form of scarlatinal otitis or nephritis.

## QUANTITATIVE SENSITISATION OF A PENICILLIN-RESISTANT STAPHYLOCOCCUS

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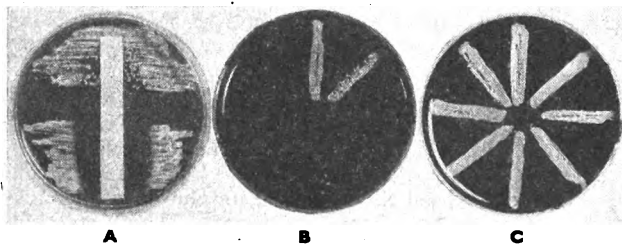
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Vourek<sup>1</sup> has reported that some penicillin-resistant organisms can be rendered sensitive by growing them in contact with certain penicillin-sensitive or penicillin-resistant organisms. An account is given here of experiments in which the sensitivity of a penicillinase-producing staphylococcus was quantitatively increased by growing it with a penicillin-sensitive streptococcus.

Strains of a *Staph. aureus* and a *Strep. pyogenes*, which had previously been found to be respectively resistant and sensitive to penicillin, were each plated on half of a blood-agar plate. A strip of filter paper dipped in a penicillin solution of 20 units per ml. was placed along the axis of the plate at right angles to the streaks of bacteria. The initial response of the two organisms to penicillin was thus verified. The staphylococcus and the streptococcus were then mixed in broth, incubated at 37°C for four hours, and then plated out. After overnight incubation a single colony of the sensitised staphylococcus was plated on half of an agar plate, the other half being covered with the unsensitised organism. Sensitivity to penicillin was determined as before by the filter-paper method. The results of this test are shown in A of the accompanying figure. In the upper half of the plate the unsensitised staphylococcus shows slight but definite sensitivity to the high concentration of penicillin immediately adjacent to the filter paper, whereas in the lower half of the plate the same organism, after sensitisation, is strongly inhibited by the penicillin.

Both the unsensitised and the sensitised staphylococci were next inoculated into a series of dilutions of penicillin in 2 ml. of broth. The following dilutions of penicillin were used (in units per ml.): 2.0, 1.0, 0.7, 0.4, 0.2, 0.1, 0.05, and pure broth. One drop of broth-culture of sensitised and unsensitised organism was inoculated into each bottle containing the penicillin dilution, and in this way a fairly constant inoculum was used. After overnight incubation streaks of the contents of each bottle of penicillin dilution were plated out radially on blood-agar plates. One plate was used for the various dilutions inoculated with unsensitised organism, and one for the various dilutions inoculated with sensitised organism. The plates were incubated overnight, and the result is shown in B and C of the figure. On each plate the streak from the highest concentration of broth is in the left-hand top sector of the plate, and the dilutions increase in an anti-clockwise direction round the plate. B shows the growth of the sensitised organism, and C that of the

1. Vourek<sup>1</sup>, A. *Lancet*, Jan. 10, p. 62.



Penicillin-sensitivity: A, growth of penicillin-resistant *Staph. aureus* in upper part, and of same organism after sensitisation in lower part; B, growth of sensitised organism in various dilutions of penicillin; C, growth of unsensitised organism in various dilutions of penicillin. Highest concentration of penicillin in left-hand top corner; dilutions increase in anti-clockwise direction.

unsensitised organism. The sensitised organism grew only in the highest dilution of penicillin (0.05 unit per ml.) and in the pure broth, while the same organism, unsensitised, grew in all the concentrations used (from 2 units to 0.05 unit per ml.). Since the unsensitised organism had been shown (see figure A) to be sensitive to a penicillin concentration of 20 units per ml. the sensitivity had been increased some two-hundredfold.

An attempt was made to increase the sensitivity of the staphylococcus by growing it with the same streptococcus for a second period of four hours; this was unsuccessful.

The streptococcus used as sensitising organism became very resistant to penicillin after incubation with the originally resistant staphylococcus. This suggested that sensitivity and resistance can be transferred in some degree from one organism to another.

### DISCUSSION

These experiments demonstrate quantitatively the increase in sensitivity which a single resistant organism has been shown to acquire after sensitisation by Vourek's method. The size of the inoculum was kept fairly constant, thus avoiding the effect, which Barber<sup>2</sup> has demonstrated, of the varying size of the inoculum on the apparent sensitivity of the organism.

The apparent transference of sensitivity from one organism to another was a striking finding. It suggests that sensitivity may depend on some highly labile property of the bacterial cell.

### SUMMARY

Experiments are described in which the sensitivity to penicillin of a relatively resistant staphylococcus was increased some two-hundredfold by growing it for four hours in contact with a sensitive streptococcus.

The streptococcus became relatively resistant to penicillin after this treatment.

I am indebted to my chief, Dr. W. G. Millar, for his advice and for taking the photograph.

## ANÆSTHESIA IN CARDIAC SURGERY WITH SPECIAL REFERENCE TO OPERATIONS FOR PATENT DUCTUS ARTERIOSUS

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As the surgery of the heart and great vessels is receiving increasing attention, and doubtless will be even more vigorously explored in the coming decade, this account of a technique evolved at Hill End Hospital by the department of anæsthetics of St. Bartholomew's Hospital may be of interest. Though it is primarily concerned with operations for the closure of the patent ductus arteriosus, the difficulties presented and the anæsthetic methods employed are in the main common to cardiac surgery in general. It is based on 53 operations performed at Hill End Hospital since December, 1939 (see table).

### PROBLEMS PRESENTED

Anatomical and pathological aspects of the operation for closure of the patent ductus arteriosus have been discussed from the anæsthetist's viewpoint by Gillies (1945). In practice we have found that, apart from the difficulties of any thoracic operation, the following points arise.

1. The surgeon's work is greatly hampered if tachycardia produces rapid pulsation of the vessels among which he is operating. On the other hand, his working near the heart may itself disturb the cardiac rate and rhythm. The healthy heart raises no complaint to mild pressure upwards or downwards, or from side to side, but

2. Barber, M. *J. Path. Bact.* 1947, 59, 373.

OPERATIONS FOR CLOSURE OF PATENT DUCTUS ARTERIOSUS

No. of cases	Age (years)		Infected	Not infected	Tachycardia	Postoperative condition			Curare
	Up to 16	Over 16				Good	Poor	Died on table	
Cyclopropane: 13	3	10	9	4	4	5	3	1	..
Ether: 30	21	9	3	27	..	1	1	1	6

OPERATIONS FOR CONSTRICTIVE PERICARDITIS

No. of cases	Age (years)		Much oedema	Cyclopropane	Ether	Tachycardia	Postoperative condition	
	Up to 16	Over 16					Good	Poor
10	2	8	6	6	4	2	4	2

\* After cardiac manipulation.

twisting of the organ produces arrhythmias or even, if the heart is unsound, sudden stoppage.

2. The patients are often children. Though ages ranged between 4 and 56, over half of our ductus cases were under 16. It is unfortunate that children often show a pronounced tachycardia under anaesthesia, as in response to so many bodily disturbances. Further, the high basal metabolic rate of a child and his intolerance of any degree of anoxia make the full oxygenation of the patient doubly important. Though children do not tolerate thoracotomy badly, we feel it inadvisable to assume, as some do, that they stand the procedure better than adults. A child with bronchiectasis may be a comparatively better risk than an adult, but only because he has perforce suffered the effects of intrapulmonary sepsis for a shorter period.

3. The patients are sometimes ill. The most serious complication is infection of the ductus arteriosus, which greatly increases the operative risk. The cases now brought to operation, however, are either uninfected or have had an infection eliminated with penicillin.

4. The vital capacity may be reduced by congestion in the pulmonary circulation, and pulmonary oedema may be present. Further, the patients are often subject to recurrent attacks of bronchitis (20% of our cases). Heart-failure may have supervened. Cases for pericardectomy usually present considerable oedema, accompanied by ascites and possibly pleural effusion, leading to severe embarrassment of respiration.

5. The characteristic rise of the low diastolic blood-pressure as the ductus arteriosus is tied is obvious, except in cases with a very narrow ductus, in which the diastolic pressure is already comparatively high. The pulse-pressure is often reduced as the ductus comes into the surgical field (Gillies 1945). Possibly this is the result of spasm of the vessel wall in response to handling. When the ductus is occluded, however, the diastolic pressure undergoes a second and more considerable rise.

REQUIREMENTS AND METHODS

Apart from satisfying the requirements of a major thoracotomy, the anaesthetic must not give rise to arrhythmia or to tachycardia.

*Premedication.*—'Omnopon' gr. 1/3 and scopolamine gr. 1/100 or morphine and atropine in appropriate doses are given to adults, and 'Seconal' and atropine to children.

*Induction.*—According to age and premedication, thiopentone or nitrous oxide is used, followed by the inhalation of a few breaths of a gas-oxygen-trichloroethylene mixture. This very small amount of trichloroethylene produces no effect on the cardiac rhythm. Oxygen and ether is then administered and a nasal or

oral endotracheal tube passed. We look on the endotracheal tube as important to maintain the perfect airway that is essential for full oxygenation of the patient.

*Maintenance* is with oxygen and ether administered with a semi-closed Boyle's apparatus. The semi-closed system has proved perfectly satisfactory and is used by us for the administration of ether because we consider it allows the depth of anaesthesia to be more delicately adjusted than with the closed circuit. The closed method is, moreover, not entirely suitable for children, the resistance and dead space of the apparatus being higher than in the semi-closed system (Adriani 1946), especially in the case of the circle absorption apparatus in common use in Britain.

Ether has been used for all cases after the first 13. In these early cases the patients were anaesthetised with cyclopropane, which was abandoned later owing to the well-marked incidence of arrhythmias and tachycardia. The high pulse-rate was clearly due to the anaesthetic, as it developed before the operation began. Both infected and uninfected cases showed this tachycardia, the pulse-rate often remaining at 120-140 during the entire operation. One patient (an adult) showed paroxysmal tachycardia, with a pulse-rate of 220, before the thorax was opened. We do not find that arrhythmias developing under cyclopropane anaesthesia can be abolished by deepening the narcosis (Thienes et al. 1941). Since we have used ether we have never been troubled with an excessively high pulse-rate or with arrhythmia, and we cannot emphasise too highly our opinion that ether is the anaesthetic of choice in these cases.

Apart from the cardinal requirement of not disturbing the heart, the anaesthetic must be deep enough to provide quiet diaphragmatic movements and obviate the possibility of mediastinal flap. Since the operation is conducted in the upper part of the chest, it is unnecessary to resort to either controlled respiration or respiration so shallow that manual assistance is required for adequate oxygenation and elimination of carbon dioxide. The patient is generally in the "third plane" by the time the periosteum of the ribs is divided. He is maintained at the same level of anaesthesia until the ductus arteriosus is tied, when the ether is much reduced or cut off altogether. By the end of the operation the patient has generally recovered his cough reflex.

If the posterolateral approach is employed, the left lung, particularly the upper lobe, goes through the operation under the firm pressure of the assistant's swab-holders. We have never experienced difficulty in re-expanding the lung as the pleura was about to be closed, and do not consider necessary the technique of reinflation at intervals of 10 minutes as recommended by Jones et al. (1940). Re-expansion is carried out by screwing down the expiratory valve, occluding the mouth and nostrils with the hand, and gently compressing the rebreathing bag. The pleura is closed with water-seal drainage. Though Gillies (1945) mentions objections to this method of re-expansion, we have never met any untoward effects from its use, and we doubt whether the collapsed upper lobe could be equally well expanded by the method of creating negative pleural pressure that he mentions.

*Curare.*—We have administered curare in conjunction with ether, using much the same technique as for thoracic cases under cyclopropane narcosis (Ostlere 1947). The effect of curare given after ether must be borne in mind and the dosage kept on the conservative side. The relation of age to dose was graduated according to Prescott et al. (1946). We would consider breaking our golden rule and administering cyclopropane, if a co-existent condition (such as a severe lung inflammation) demanded it, by combining it with curare in full doses. We have been impressed with the freedom from tachycardia, bradycardia, and other cardiac irregularities

offered by such a technique. We have been chary of administering curare to children for this operation, since we did not feel that their response to curare could be predicted as accurately as with adults. Bearing in mind the uncertain action of curare on the heart we have relegated its use to cases where considerable diaphragmatic movement is persistently troublesome.

**Condition of Patient.**—A slow blood drip is set up as a prophylactic measure. Though one must consider the circulatory readjustment which takes place as the ductus arteriosus is tied (Gillies 1945), it should be noted that the narrow ductus will not give the "auto-transfusion" mentioned. In uninfected cases the patients should leave the theatre in good condition.

#### SUMMARY

The practical difficulties of anaesthetising patients for ligation of the patent ductus arteriosus are discussed.

A technique using ether with the semi-closed apparatus is described, and its advantages are considered.

Our thanks are due to Mr. O. S. Tubbs for his help in the preparation of this paper.

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## UNUSUAL CAUSE OF SPASM OF PSOAS MUSCLE

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THE following case of pleural effusion is of interest because the only early signs were fever and spasm of the left psoas muscle.

A man, aged 30, was admitted to a Ministry of Pensions Hospital on Dec. 17, 1946, with 11 weeks' history of pain in the left kidney region. Sitting up caused a squeezing sensation in the region of the heart, and this symptom was of recent onset. Mitral disease had been diagnosed two years previously after a hæmoptysis. His present illness began with tonsillitis, and this was followed a week later by pain in the region of the left kidney for which he was admitted to his local civilian hospital. There he was found to have spasm of left psoas which restricted movements of left leg. The spasm, it was thought, might possibly be due to infection in kidney area, and perinephric abscess was provisionally diagnosed. Radiography of spine, renal investigations, and intravenous pyelography gave normal results. Radiography of chest showed only some fibrosis of lungs. The patient had considerable pyrexia in hospital and took his discharge on Dec. 4 against advice before a final diagnosis could be established.

On admission to the Ministry of Pensions Hospital (Dec. 17) he said that during the last fortnight he had developed slight cough and dyspnoea at rest. Much weakness, loss of weight, and feverishness were symptoms of longer duration. He said he had received penicillin 1,000,000 units by injection at his local hospital.

**Examination.**—General condition poor, with emaciation and dry tongue. Scoliosis and dorsal kyphosis. Apex-beat diffuse in 4th and 5th left intercostal spaces; presystolic thrill near apex; no apparent enlargement of heart, and no displacement; rumbling crescendo presystolic murmur at apex, ending in loud first sound. Diminished movement and absence of vocal fremitus over left base anteriorly and left side posteriorly; stony dullness and absent breath sounds at left base anteriorly (2 in. vertical extent) and over lower two-thirds of left chest posteriorly; bronchophony and whispering pectoriloquy at upper border of dullness. Resistance in left loin. Left leg slightly flexed, but could be straightened without pain; movement limited at left hip; slight flexion and external rotation causing spasm of adductors of left thigh. Pelvis tilted slightly to left, causing  $\frac{1}{2}$  in. of apparent shortening of left leg.

**Radiography of chest** suggested collapse of left lower lobe rather than encysted effusion. Postero-anterior view showed an opacity at the left base with horizontal upper border. Left lateral view showed a triangular shadow, apex upwards, near the spine—possibly collapsed left lower lobe.

A *provisional diagnosis* of pleural effusion was made, owing to the extent and degree of the dullness, and because the physical signs seemed more extensive than those obtained with collapsed lower lobe.

**Progress.**—Temperature 97–98.4° F in morning, with evening rise every 2–3 days to 100–100.4° F. Dec. 19: Hæmoglobin 85%; red cells 4,000,000 per c.mm.; white cells 12,000 per c.mm. (polymorphs 65%); erythrocyte-sedimentation rate 6 mm. in 1 hour; blood-urea 40 mg. per 100 ml. Dec. 27: chest aspirated because patient was very ill, still febrile after 11 weeks; half a pint of straw-coloured fluid, almost clear, was withdrawn from left 8th intercostal space below inferior angle of scapula, and examination showed albumin ++, sp. gr. 1.020, with pus cells and pneumococci present.

Penicillin 250,000 units was given intramuscularly every day for 4 days, and then 40,000 units 6-hourly for 4 days, since patient was still febrile. On Jan. 4 his general condition had improved considerably, but physical signs and radiography indicated marked increase of fluid in left chest. Temperature was 98–98.4° F in evenings, with occasional rise to 99° F. Fluid removed on Jan. 6 was sterile, but penicillin 100,000 units was injected into the effusion as a preventive measure. From Jan. 12 the temperature was normal. On Feb. 3 blood examination showed Hb 90%, red cells 4,600,000 per c.mm., white cells 7000 (polymorphs 60%). By Feb. 15 the patient was up all day and free from symptoms and signs. Radiography of chest showed lungs normal.

In this case, during the period of difficulty in diagnosis, a diaphragmatic pleurisy on the left side was evidently present, causing spasm via the internal arcuate ligament of the diaphragm, and possibly by irritation of the left crus of the diaphragm, and spasm of the muscles due to pain referred along intercostal nerves from the outer part of the diaphragm. This was followed by a left pleural effusion, coinciding with diminution in pain and muscle spasm.

The question arises whether the diaphragmatic pleurisy was merely the accompaniment of a basal pneumonia. Probably it was, because pleural effusions due to pneumococci are usually caused by pulmonary lesions, and diaphragmatic pleurisy is hardly likely to last 8 weeks as a dry pleurisy.

Osler states that, if the effusion is circumscribed to the diaphragmatic surface, pain simulates that of an acute abdominal disease, and it may be that the effusion was originally so circumscribed. He also states that there may be signs of collapse of the left lower lobe, but apparently this was not present at the previous hospital. The X-ray appearances suggested collapse of the left lower lobe rather than encysted effusion.

Osler further mentions that an effusion beginning in this way is usually plastic. In the present case it was fairly clear and straw-coloured, and could be aspirated through a hypodermic needle, but its consistence had possibly been modified by the penicillin previously administered at the patient's local hospital.

I wish to thank the Director-General of Medical Services, Ministry of Pensions, for permission to publish this case.

"... dare I submit that the doctor needs a little more than his next-door neighbour? He has much less time of his own and must pay for service. He works very long hours—I am told the good doctor always will—so he pays a man to paint his nursery, clean his car, make his hen-house, plant his garden, and mend the electric iron. . . . His wife, if she is lucky, has a little extra help to balance those meals at impossible times, and all those phone calls during her busy day. . . . I like my life immensely and my husband is absorbed in his. . . . It is just rather difficult, as many beside ourselves are finding out, to live with one foot in the old world and one in the new."—A Surgeon's Wife in the *Lady*, March 18, 1948, p. 177.

## Medical Societies

### LIVERPOOL MEDICAL INSTITUTION AND MANCHESTER MEDICAL SOCIETY

A JOINT meeting was held at Liverpool on March 4, with Prof. T. P. McMURRAY in the chair.

#### Backache-Sciatica Syndrome

Sir HARRY PLATT gave a historical review of the stages through which our present knowledge of the pathogenesis of the backache-sciatica syndrome has been reached. During the last forty years, he said, a sequence of possible aetiological factors had been considered and discarded—sacro-iliac and lumbosacral strain, lumbosacral skeletal anomalies, intervertebral arthritis, and the contracted iliotalibial band. The present view was that the prolapsed intervertebral disc was a dominant lesion in sciatica. Many thousands of successful disc operations for the relief of backache-sciatica had been carried out by neurological and orthopaedic surgeons in Great Britain and the United States; but at operation it was sometimes impossible to demonstrate a disc lesion, and extravagant claims had been made for the disc as the only "reputable" cause of sciatica. An extensive survey of backache-sciatica cases in the Mayo Clinic had shown that disc lesions were in the minority. The speaker quoted with approval the opinion of Love that disc protrusion is the commonest intraspinal cause of sciatica; this meant that extraspinal causes were not myths.

Diagnosis of the cause of sciatica, he concluded, could be approached by the recognition of five main groups:

1. Pelvic visceral disease.
2. Bony lesions of the lumbar spine, pelvis, and femora—i.e., destructive lesions, inflammatory or neoplastic.
3. Joint lesions of the spine, pelvis, and hips. In this group the protruded disc had displaced sacro-iliac strain and vertebral arthritis as the dominant lesion, but these two were still real lesions, and sciatic pain was common in osteo-arthritis of the hip-joint.
4. Central nervous lesions proper—e.g., cauda-equina tumours.
5. Pseudo-sciatica—fibrositis of the fascial, ligamentous, and muscular structures in the lumbar region, buttocks, and thighs. This type of "sciatica" was numerically important; fibromyositis might of course cloak an underlying arthritis of the lumbar spine in which degenerative changes were likely to be present in the intervertebral discs.

Prof. GEOFFREY JEFFERSON, F.R.S., agreed that the single brief attack of sciatica (for which a better name was the late George Riddoch's non-committal "posterior crural pain") could conceivably be due to neuritis; but this could not be proved, and even then a small disc rupture might have taken place. Neuritis, in the proper sense, was a rare disease. He, with Mr. F. K. Kessel, had followed up patients with sciatic "neuritis" seen earlier than five years ago. Replies were obtained from 26 unoperated patients. Of these no less than two-thirds had continued to have attacks; 3 had been badly handicapped, while in the remainder attacks had been remittent with only rare severe episodes. This finding was in line with the Scandinavian reviews of close on 500 patients, and it lent little support to the contention that sciatica was commonly a transient and unimportant disorder. Yprehus (1947) found that only 33.8% of unoperated cases were fit for full work, whilst in Boysen's (1947) survey only 21.1% were quite free from pain. Relapses in unoperated cases could be accounted for in three ways: (1) because there is from time to time a sudden further small protrusion of disc tissue; (2) because, the prolapse remaining unchanged, there are recurrent episodes of oedema or congestion; and (3) because the tension excited by the hernia is intermittent, the disc popping in and out. This process was very difficult to believe in; the hernia probably caused pain by tension rather than pressure on the nerve-root.

Turning to his operation material, Professor Jefferson said that of 130 cases operated upon by himself or

his assistants no disc protrusion had been found in only 8. The problem of alternative causes of sciatica was not as great as some believed; nevertheless the negative cases were very important. Sufficient time had not yet elapsed for assessment of the after-histories of patients with negative operation findings. Patients from whom a disc had been removed were, in the main, either cured or left with only insignificant pain; this was so in 82% of the speaker's series, and surgeons must agree that any operation that produced results of this order was good. The relation between disc herniation and sciatica was now firmly established; but the history and clinical signs of cases with a disc lesion were often identical with those where there was no such lesion, and the differences which should be there must be discovered.

## Reviews of Books

### Local Government

Sir ARTHUR MACNALTY, K.C.B. London: Methuen. Pp. 222. 1948. 4s. 6d.

THE former chief medical officer of the Ministry of Health needs no introduction to medical readers. This book reflects on every page his wide practical experience and ripe scholarship. Literary quotations and historical illustrations enrich Sir Arthur's clear account of every phase of local government, and make the reading of his book a refreshment to the stored mind, as well as an education to the one less well furnished. His "concise account of the principal features of local government and of its history, development, and changing character" will be invaluable to workers in many fields—social, medical, and political. The chapters on the health services have obviously been a labour of love, and could hardly be bettered. Sir Arthur's vision, however, is not blinkered, and he remarks, on the education service, on the "fruitful field of endeavour and progress (which) lies before members of education committees for years to come. . . . It demands the best brains, the most industrious workers, the largest and most sympathetic hearts."

The summaries, each in the appropriate chapter, of the recent legislation affecting local government are particularly clear. The National Health Service Act is concisely dealt with and its general aims and method commended. This book gives pre-war value at a pre-war price.

### Hypnotism Today

L. M. LECRON, B.A.; J. BORDEAUX, B.A., M.A., PH.D. With a foreword by Milton H. Erickson, M.D. London: Heinemann Medical Books. 1947. Pp. 275. 25s.

THE authors describe themselves as "consulting clinical psychologists and psychotherapists" and "consultants in hypnosis," and it is evident from the chapters on the technique and phenomena of hypnosis that they are experienced operators who are prepared to present the results of their experience in a helpful form. A good deal of reference is made to the technique of demonstrating hypnosis on the stage and in the lecture-theatre, and the authors have much practical advice for those interested in that field.

It is evident that the intention is to present the subject as a branch of psychology and to dissociate it from the taint of occultism, unethical exploitation, and popular superstition which has retarded its scientific investigation in the past. This is attained in the first part, devoted to hypnotism and suggestion, in which the conventional history of hypnosis, repeated in every comprehensive textbook on the subject since 1900, is given together with a brief and sketchy critical review of more recent work on the subject. There is in fact not much new material to add to that described by such well-known authors as Moll, Forel, James Bramwell, Clark Hall, and Schilder and Kauders. The fairly extensive account of parapsychological matters, including telepathy and clairvoyance, seems—though the authors are careful to explain their lack of relevance—out of place. On the other hand the discussion on the relation of hypnotic phenomena to spiritualism and healing cults shows common sense and makes good reading. It is a pity that the

opportunity was lost of providing a full bibliography of modern work on the subject.

The second part aims at pointing out that misconceptions about the subject, both lay and medical, and failure to teach the technique adequately to students of psychiatry, have led to an underestimate of its value in psychological treatment. In this worthy object the writers fail because they claim as the hypnotist's legitimate field virtually the whole of the neuroses and psychosomatic disorders in adults and children. It is reasonable to suggest that some form of short psychotherapy is needed to overcome the difficulties of time and expense which at present stand in the way of the treatment of the vast majority of those with psychogenic disorders; but their proposal is that clinical psychologists trained in hypnotic technique could fill this gap. The chapters in which the theoretical background of psychiatry and psychotherapy are described are fully illustrative of the dangers of entrusting such work to those whose reading of this subject is as ill-digested as theirs. After a promising start the book strays on to much less certain ground where the claims of the "hypnotic consultant" to replace the psychiatrist in the new field of psychosomatic medicine are strongly pressed for the benefit of an uncritical public.

Hypnosis has been repeatedly rediscovered, and there is reason to believe that the studies now being made at the Menninger Clinic and elsewhere are on more scientific lines than heretofore. There are many fields to which such studies can contribute; but the work of these authors, as presented, does not conform to the necessary standards. To those intending to use hypnosis clinically, however, the chapters on technique are of interest.

#### Thromboendangittis obliterans des Gehirns

*Neurologisch-psychiatrische Syndrome.* F. LLAVERO, DR. MED. Basle: Schwabe. 1948. Pp. 248. Sw. fr. 24.

THIS beautifully produced monograph testifies to the width of the author's reading rather than to the thoroughness of his clinical and pathological investigations. He reports 14 cases of the disease which he personally observed, but of these only 3 were confirmed by pathological examination, and a 4th by arteriography. Even if full allowance be made for his difficulties—he is a Spaniard and carried out the work in Professor Bumke's clinic in Munich during the war—these cases seem an unsatisfactory basis for so comprehensive a study of the disease. In many of them, the clinical and radiological findings permit only the conclusion that the cerebral disorder was of vascular nature; and in his chapter on diagnosis the author frankly concedes the difficulties of distinguishing Buerger's disease during life from arteriosclerosis and other conditions, such as Alzheimer's disease. Besides the description of his 14 cases, Dr. Llaveró reviews the morbid anatomy, ætiology, and pathogenesis of the condition, the use of encephalography, arteriography, and capillary microscopy for its detection, and the changes in the cerebrospinal fluid and the fundus, and concludes with brief chapters on prognosis and treatment. His monograph contains nothing new, but is a handy and thorough compendium of the German literature.

#### Secretarial Practice and Office Administration for Hospitals

J. E. STONE, C.B.E., M.C., F.S.A.A., F.R.ECON.S., F.S.S., F.H.A. London: Faber. 1947. Pp. 205. 21s.

T. H. Huxley defined science as clarified common sense. In this book, a companion volume to his *Hospital Organisation and Management*, Captain Stone shows how the method of science may be applied to the daily activities of the house-governor's department. Scientific management, he says, means management based on facts, and he proceeds to demonstrate how business efficiency may be introduced into existing organisations. Do you wish to know how to conduct a meeting, how to interview a candidate, how to write a précis, how to renew the office equipment, the meaning of "per pro," how to reorganise your filing system, or how to order groceries in bulk? The answers to these and a thousand and one other questions are to be found in this book, which is written in the simple, easy, and natural style

commended by the author to his readers. Though addressed primarily to executive lay officers and to those studying to become such, there are many useful reminders which appeal to the general and medical reader. Indeed the book may be read with profit, as Sir Ernest Pooley suggests in the foreword, by "every hospital officer no matter what his position."

The words "patient," "bed," "doctor," and "nurse" do not appear in the index of this work. But a happy and efficient hospital depends upon the closest liaison between the professional and lay servants of the hospital in all its departments, and one would have welcomed a chapter from Captain Stone on "Medical Staff and the Secretary's Office."

#### British Surgical Practice

Vol. II. Editors: Sir ERNEST ROCK CARLING, F.R.C.S., F.R.C.P., consulting surgeon, Westminster Hospital; J. PATERSON ROSS, M.S., F.R.C.S., director of surgical clinical unit, St. Bartholomew's Hospital, and professor of surgery in the University of London. London: Butterworth. 1948. Pp. 540. 60s.

WE reviewed the first volume of this well-produced work last year (*Lancet*, 1947, ii, 912). The second perhaps surpasses its predecessor, for the book is getting properly into its stride. The 38 sections start with "backache" (a masterly summary by Prof. Henry Cohen) and ends with "bursæ." About half the book is concerned with the bladder, the bones, the brain, and the breast, to each of which four or five sections are devoted. The lesser subjects, dealt with in a single subject, are no less worth attention and many of them are very good (for example, bacteriology by Dr. E. T. C. Spooner). The stale material which cumbered so many surgical textbooks has been left out, and there is a gratifying economy in the use of words: large as it is, this work is not inflated with windy prose.

**Hope and Stallybrass's Text-Book of Public Health** (12th ed. Edinburgh: E. & S. Livingstone. 1948. Pp. 571. 30s.).—The new edition of this well-known textbook shows few changes in the scientific chapters from the 11th edition, published in 1946, and now out of print. But Prof. W. M. Frazer and Dr. C. O. Stallybrass have brought the sections on the administrative side into line with new legislation. The book will therefore be in demand by administrators, as well as by candidates for the certificate and diploma in public health—who will find it covers fully the syllabus under the new rules of the General Medical Council.

**Treatment of Rheumatism in General Practice** (4th ed. London: E. Arnold. 1947. Pp. 258. 12s. 6d.).—In its new edition Dr. W. S. C. Copeman's book remains for the general practitioner a valuable survey of the available means of treating an ever-present, and often baffling, group of illnesses. He takes pains to explain simply the commoner clinical manifestations of rheumatism, examines their possible causes, and (avoiding the mistake of crediting his reader with a full knowledge of modern technique in treatment) gives in helpful detail the rationale of medicinal, dietetic, physiotherapeutic, and climatic methods. The previous edition appeared in 1939, and though the author refers to his own recent researches on the ætiology of fibrositis, he says little about other developments during and since the war. Perhaps that is because he has found little worth saying.

**The Oculorotary Muscles** (London: H. Kimpton. 1947. Pp. 359. 40s.).—British readers of this book, by Dr. Richard G. Scobee, of St. Louis, may be under some misconception of its scope. What he terms the oculorotary muscles would here be known as the extra-ocular muscles—namely, the recti and oblique muscles of the eye. The first 7 chapters deal with the anatomy, physiology, and mechanics of the ocular muscles; then follow 10 on the manifestations of latent and manifest squint and another 10 on diagnosis. Only the last 3 chapters describe treatment, and that very sketchily, a good part being made up of extracts from Chavasse. It may be said, then, that for British readers this is a book on the diagnosis of squint. The steps in diagnosis are clearly arranged, the author rightly maintaining that the only sound treatment is that based on a correct analysis of the case; but his style, with its free use of italics, is perhaps rather elementary for his specialised audience.

# THE LANCET

LONDON: SATURDAY, MAY 1, 1948

## A Tuberculosis Survey

In a week when the thoughts of the nation have been taken back twenty-five years, it is natural to compare conditions now with those of 1923. In tuberculosis the outstanding difference is in the annual mortality, which in England and Wales has fallen by nearly half. But this seems to be a matter for thankfulness rather than for self-congratulation; for the decline has been remarkably constant from year to year and thus shows no sign of being due to any particular anti-tuberculosis measure. The second important improvement is in diagnosis, and this we owe chiefly to better radiological technique. We can now discover slight lesions, old or recent; the type of disease, especially the presence of cavitation; and alterations which have taken place since a previous examination—all this to a degree unknown in 1923. Collapse therapy was at that time in its early and tentative stages, and thoracic surgery was even less advanced, at any rate in England. Gold therapy was on its way; now it is the turn of streptomycin. In 1923 the farm colony was losing its short-lived popularity, and it has since been superseded by vocational training, reablement, treatment allowances, and the development of aftercare.

Notable advances, then, have been made in diagnosis, in treatment, in social service, and in knowledge of the pathology of tuberculosis. But improvement in methods of prevention has been comparatively small. For the greater part of the period we have relied mainly on contact examination. True, the examination of the march-past variety has been to some extent replaced by careful and long-continued observation of selected persons, and the advent of mass radiography has opened up a new field in the detection of the symptomless case. But to discover the onset of tuberculosis, however early the stage, is not really prevention. Moreover, too many cases are still diagnosed for the first time when the disease is already moderately advanced. We need to go back to the stage before the infection has overcome the resistance. The problem is not easy, because the operative factors in the infection and in the failure of resistance may vary from patient to patient. Thus the infection may be the exacerbation of an old primary infection, or a recent primary infection, or an exogenous reinfection; and the failure of resistance may be attributable to genetic factors, to nutritional or environmental defects, to the failure or loss of a specific acquired immunity, and perhaps to several other causes.

The Prophit survey undertaken by the Royal College of Physicians in 1934 was designed to throw light on these matters. Its avowed object was to try to determine whether it is possible to pick out those persons or groups of persons most likely to develop

tuberculosis. The method chosen was the observation of young adults, with annual skin-testing (Mantoux test), with X-ray examination, and in some cases with a clinical examination as well. The volunteers fell into four groups: (1) contacts attending tuberculosis dispensaries and known to be exposed to a relatively heavy degree of infection; (2) controls, mainly office workers, exposed to the ordinary risks of tuberculous infection inseparable from urban life; (3) nurses from group A hospitals which admitted all classes of case, including those of advanced tuberculosis, and from group B hospitals admitting a more selected type of patient; and (4) medical students in preclinical and in clinical years. To these were added, in 1937, entrants to two naval training establishments. It was hoped to observe 5000 persons in each group, and each for a period of five years, in a survey lasting for ten years. The outbreak of war in 1939 led to a drastic curtailment of the scope of the survey, and in fact the total number admitted was just over 10,000. Only the nurses' group remained relatively unaffected, and hence the results and conclusions of the report<sup>1</sup> are drawn largely from this group.

In 1944 we published an interim report<sup>2</sup> describing the survey of nurses from the two types of hospital, A and B. The more important results now recorded for the survey as a whole are these:

(1) The percentage of entrants reacting to tuberculin was 93 in the contact group, 64 among the naval boys, and 80-85 in the other three groups. This is a decidedly higher rate than those reported recently from Scandinavia, Canada, and the United States.

(2) Mantoux conversion, from negative to positive (due to the occurrence of a first infection), took place during the first year in 80% of group A nurses, in 54% of group B nurses, in 36% of medical students, and in 26% of controls.

(3) About 95% of these primary infections passed without harm, although 30% of persons had transient symptoms and 8% revealed the presence of lung lesions in the X-ray film.

(4) The subsequent history of the groups showed that the risk of developing tuberculosis was more or less proportional to the degree of exposure to infection.

(5) A maintenance, or a rise, in tuberculin sensitivity is associated with repeated reinfections.

(6) Nurses tuberculin-negative on entry have a higher morbidity than the tuberculin-positive—a confirmation of results obtained in Oslo and elsewhere.

(7) Though the majority of the lesions discovered under observation were minimal, about half became serious enough to need sanatorium treatment.

The report deals also with the aspects and prognosis of the small lesion, and with the pathology, and measures for the control, of pulmonary tuberculosis in young adults. It is a clarifying piece of research which should assist in reducing the incidence of the disease; and though, in the nature of things, it can hardly be said to mark a turning-point in our efforts to prevent tuberculosis, it shows a most creditable thoroughness on the part of the Prophit Committee and scholars in a task where thoroughness was the first essential.

1. Tuberculosis in Young Adults: report on the Prophit Tuberculosis Survey, 1935-44. By MARC DANIELS, M.D., FRANK RIDEHALGH, M.R.C.P., and V. H. SPRINGETT, M.B., and including results of work done by I. M. HALL, M.R.C.P. London: H. K. Lewis, 1948. Pp. 227, 30s.
2. Daniels, M. *Lancet*, 1944, ii, 165, 201, 245. Leading article, 1944, ii, 249.

## Pulmonary Œdema

THE elusiveness of the lesser circulation remains a source of regret to the inquiring physician. Until comparatively lately his knowledge of its hæmodynamics was derived almost wholly from simple clinical examination with the stethoscope, aided by radiography and sometimes by necropsy control. His sphere of investigation has undoubtedly been enlarged by additional methods of research, but despite the further information provided by the electrocardiogram and cardiac catheter, by estimations of vital capacity and circulation-times, and by analyses of alveolar air, he still knows less about the lesser circulation than about the more accessible systemic circulation. Nevertheless, translation of experimental evidence is rapidly increasing our understanding of the pulmonary circulation and hence our familiarity with pulmonary œdema.

In his Sydney Ringer lecture delivered at University College Hospital on March 16, Prof. G. R. CAMERON, F.R.S., emphasised the difficulties of precise conclusions. As a unifying ætiological principle in pulmonary œdema, of whatever cause, he postulates a disturbance of capillary permeability in the lungs, supporting his argument by analysis of œdema fluids from cases of differing ætiology. These fluids showed a uniformly high protein content, approaching the level of blood plasma, which suggests that the œdema is a true capillary transudate. To what extent this is controlled by nervous influences, modified by alterations in capillary blood-flow, or affected by changes in environmental gases, cannot yet be said. In the pulmonary œdema produced experimentally in animals by large doses of adrenaline a neurogenic factor evidently predominates, since division of the vagi prevents its development, and the same is true of the pulmonary œdema of cerebral trauma. On the other hand, the effects of a too rapid paracentesis of the chest, and the œdema that accompanies pulmonary embolism favour the hypothesis of increased capillary permeability.

The mechanism of pulmonary congestion from circulatory disorders has been less easy to study experimentally, though clinical observation has been fruitful. It can more easily be understood if we picture the lungs as a vascular sponge or cushion lying between the inflow tap of the right ventricle and the outlet drain of the left heart. Though in the ordinary way the vascular bed in the lungs provides a generous safety margin, which is governed by compensatory reflex devices in its circulatory arrangements, these reserves become overloaded under certain conditions. When the evacuating pump weakens through left ventricular strain or failure; when there is obstruction to the outflow, as in certain cases of extreme stenosis of the mitral valve without left-auricle dilation; when the persistent filling action of a powerful right ventricle is inordinate; or when a significant area of lung territory is rapidly eliminated by embolism, infection, trauma, inhaled irritant gases, or blood-borne chemicals such as phenyl thiourea or adrenaline—in all these circumstances congestion and œdema of the lungs develops. It is, however, only when the œdema becomes pronounced that serious disturbances of function appear. For example, pulmonary œdema of left-ventricle failure,

as BEDFORD<sup>1</sup> has pointed out, may vary in range from nocturnal cough and slight wheezing, with scanty basal crepitations, to suffocative dyspnoea with waterlogged lungs and hydrothorax. BEDFORD divides its clinical manifestations into paroxysmal pulmonary congestion, pulmonary congestion of effort (often closely associated with angina but occurring also in mitral stenosis), and chronic pulmonary congestion. This last group is perhaps of most interest to the clinician, because, being less dramatic, its incidence is often overlooked, yet the diagnosis can be made with fair precision and much can be done in the way of treatment. In these patients pulmonary congestion persists without appreciable systemic engorgement and with a normal venous pressure. Their symptoms of effort dyspnoea, cough, hæmoptysis, and sometimes orthopnoea are liable to be confused with chronic bronchitis because of the absence of systemic œdema unless the history and clinical findings are taken into full account. Examination will then reveal signs of left-ventricle failure—namely, an enlarged or forceful heart with apical gallop rhythm and loud pulmonary second sound, a fast but regular pulse, a high diastolic and frequently a raised systolic blood-pressure, pulsus alternans (maybe of a few millimetres only), râles at one or both lung bases, possibly a hydrothorax, and electrocardiographic left-axis deviation and T-wave inversion in the first lead. Admittedly emphysema is often present in the patient whose left heart is failing, corrupting the niceties of an accurate diagnosis, but help is gained from the arm-tongue circulation-time, always significantly prolonged in these cases, whereas in bronchitic asthma and emphysema it is normal or even shortened; radiography may reveal characteristic circumhilar congestion of pulmonary œdema, perhaps with interlobar or pleural collections of œdema fluid and an enlarged heart, or conversely exclude obvious chronic lung disease; and finally the electrocardiogram may be typical. A further observation of differential value is that whereas pulmonary œdema tends to waken the sufferer after only three or four hours' sleep, the wheezing of chronic bronchitis is seldom manifest until early dawn. The importance of these diagnostic criteria in this variety of pulmonary œdema is perhaps insufficiently recognised. Their significance relates to timely treatment; for rest, morphine, venesection, digitalis, mercurial diuretics, and oxygen afford considerable relief. A paroxysm of pulmonary œdema may be brought about by recumbency, when some anoxæmia results from the increased volume of blood in the lungs and the diminished vital capacity, or again by the increase in capillary engorgement caused by a bout of coughing or an attack of bronchitis. CAMERON says that moderate depletion of plasma protein is a further contributory factor. But there can be little doubt that in the causation of œdema of the lungs in circulatory failure the influence of pulmonary hypertension is paramount. When this factor is eliminated with the onset of failure of the right heart, pulmonary œdema disappears dramatically. It may also be that the development of a "second wind" in the distance runner represents the onset of a physiological tricuspid incompetence. The absence of pulmonary stasis and the radiological

1. Bedford, D. E. *Lancet*, 1939, i, 1303.



clarity of the lungs which are associated with organic tricuspid disease has often been remarked. This safety-valve mechanism of the tricuspid valve, described over a hundred years ago by KING,<sup>2</sup> has an important bearing on the relief of pulmonary congestion.

The problem of œdema in general is fundamentally a study of capillary hydrodynamics. It is, however, in its application to a particular organ, the lungs, that the present difficulties lie. Indeed, the closed book of the pulmonary circulation has yet to be read. Perhaps we shall find its pages freely illustrated with observations not only from cardiovascular disease but also, as CAMERON implies, from studies of disturbances of the central nervous system and from specialised fields of toxicology, industrial medicine, and even war.

### Surgery of Aortic Coarctation

THE variety of aortic stenosis known as coarctation of the aorta is one of the types of congenital heart disease which in the last few years has been brought within the scope of surgery. Without operation about a quarter of the patients died before the age of 20 and half before 40, though there seem to be two distinct groups: in one symptoms arise in childhood and it is unusual for the patient to live much beyond 30; while in the other there may be no symptoms, the lesion being found by chance in adult life, and the outlook is much better. Most of the patients died from the direct or indirect effects of the coarctation on the heart—from congestive failure, bacterial endocarditis, rupture of the heart or aorta—but perhaps 1 in 10 died from the rupture of a cerebral aneurysm, a congenital defect often associated with coarctation.

The extensive collateral circulation which develops in these patients, and which shows itself in the characteristic dilated vessels on the back and abdomen, makes it possible to clamp the aorta for half an hour or so without prejudicing the cerebral circulation. This is the basis of the operative treatment devised by CRAFOORD in Sweden after much experimental work on occlusion of the aorta in animals and observations made when the aorta was clamped during an operation for patent ductus. He first successfully resected a coarctation, with an end-to-end anastomosis of the aorta, in October, 1944, and by July, 1947, he had done 22 such operations, with 2 deaths and 20 complete successes. In this period he found only 3 patients in whom the operation was deemed impracticable after thoracotomy; 2 of these died. In the 20 successful cases the blood-pressure in the upper part of the body fell to, or near to, normal, while that in the legs rose, and the circulation was greatly improved as judged by oscillometric records. Some parts of the visible collateral circulation disappeared quickly and the patients who had had symptoms felt enormously better and were able to do much more. One of CRAFOORD's patients<sup>3</sup> described in these columns the remarkable improvement obtained after operation. It may be some time before one can assess the operative risk in other hands because no series of comparable length has yet been published, but CRAFOORD's 10% mortality seems a reasonable risk to take, considering how greatly the expectation

of life is improved in surviving patients. Even the risk of death from a ruptured cerebral aneurysm must be greatly reduced by the fall in blood-pressure, though it may not be entirely abolished. In his HONYMAN Gillespie lecture in Edinburgh on April 15, Dr. RÆ GILCHRIST pointed out that the best prospect of surgical cure is in young patients, in whom arteries are resilient and the danger of an intrathoracic operation is lowest. Atheroma of the aorta is present in a large proportion of coarctation patients over the age of 25.

It now seems reasonable to advise surgical treatment in any patient under 20 with symptoms due to the coarctation or with a greatly increased blood-pressure. Over 20, or perhaps 25, surgery seems inadvisable if the patient is relatively well. The patient of this age with progressive symptoms provides a difficult problem. Coarctation is said to occur in one person in a thousand but there do not seem to be many waiting for operation; the Society of Thoracic Surgeons could usefully publish a combined report on their experience to help the physician who is called on to decide this question.

## Annotations

### DECISIONS

THE final day for the return of votes in the plebiscite is now Saturday, May 1; so the figures will not be known until next week. Meanwhile the local executive councils have been sending out letters inviting general practitioners to join the National Health Service, each letter being accompanied by printed notes explaining the general arrangements for the service and the remuneration offered. Normally, it appears, the maximum number of patients acceptable on a doctor's list will be 4000; but in a partnership individual partners can accept up to 5000, so long as the average per partner is not more than 4000, and for each employed assistant a further 2400 can be taken. At the outset "these maxima may have to be exceeded in certain cases to enable patients who so wish to continue with their present doctors in the new scheme." It is announced that "grants for the supervision of the training of assistants will amount to £150 a year, plus the salary of the assistant and boarding expenses (together not exceeding £700 a year) with an allowance not exceeding £150 a year if an additional car is necessary." To continue to receive the "fixed annual payment" of £300 the practitioner will normally have to have at least 500 patients on his list within two years of becoming a principal; but smaller fixed payments may be made by agreement. Where a doctor is receiving a fixed annual payment, the local executive council, in dividing the sum available for capitation fees, will credit him with only six-sevenths of the actual number of patients on his list. The sums that individual doctors are to receive in return for the goodwill of their practices cannot be estimated, but "it is contemplated . . . that the total amount will be divided . . . in proportion to their gross incomes from general medical practice in the last convenient accounting year before the 5th July."

During this week the Ministry has also been sending, to every family in Britain, a leaflet explaining what the National Health Service offers and how it can be used. It asks the public to "help to have the Scheme ready by 5th July by choosing your doctor at once" and remarks that "if one doctor cannot accept you, ask another, or ask to be put in touch with one by the new 'executive council' which has been set up in your area." Decisions therefore cannot be long delayed.

2. King, T. W. *Guy's Hosp. Rep.* 1831, 2, 103.

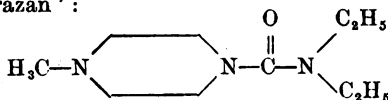
3. van Diggelen, H. T. *Lancet*, 1947, ii, 64.

## CURE FOR FILARIASIS ?

Manson's demonstration of the remarkable nocturnal periodicity of *Wuchereria bancrofti*—the microfilariae being numerous in the blood at night but absent during the day—caused sceptics to inquire whether these organisms carried watches in their pockets to guide their migrations. Interest in the condition was aroused again during the late war when a large body of American troops was stationed in Samoa under exposure to the mosquitoes carrying filariasis. Many G.I.s contracted the infection; and seeing scrotal elephantiasis among the natives they were not unnaturally perturbed.

This difficult position drew attention to the absence of specific remedy. Probably the principal reason for this was the difficulty of experimentation, since human filariae cannot be transferred to lower animals, and the only common animal carrying its own filariasis—the dog—is too cumbersome for convenient handling. Consequently all experiments have had to be made in man, and at one time or another almost all the known therapeutic compounds have been given to filarial patients. It was clear that apart from a lucky chance, progress would come only with the discovery of a suitable animal. About 1940 American workers began to use cotton rats (*Sigmodon hispidus*); many of these rats contain a filarial worm—*Litomosoides carinii*—and Culbertson and his associates<sup>1</sup> showed that this was convenient for investigation of the immunology and chemotherapy of filariasis. In 1945 Williams and Brown<sup>2</sup> discovered that infection is transmitted through the tropical rat mite *Liponyssus bacoti*, and apparently most of the American experiments are still done on wild rats with spontaneous infection. Workers in England have shown, however, that infection can be passaged in the laboratory and that cotton rats bred in this country can be readily infected.

The first reward from the discovery of the new experimental tool was the finding by Culbertson and Rose that antimony preparations, in large amounts, destroyed the adult worms of *W. bancrofti* in a high proportion of patients although the number of microfilariae was not reduced for several months; but the dose needed was too near the toxic level for this treatment to be used unless cure could be guaranteed. A much more hopeful drug has been discovered by Hewitt and his colleagues<sup>3</sup> in 1-diethylcarbonyl-4-methylpiperazine hydrochloride or 'Hetrazan':



In infected cotton rats this causes rapid disappearance from the peripheral blood of most of the microfilariae, but the adult worms of *L. carinii* are killed much less easily. Clinical trials have been carried out in the West Indies,<sup>4</sup> where 26 patients harbouring microfilariae of *W. bancrofti* were given the drug by mouth in doses ranging from 0.5 mg. to 2 mg. per kg. body-weight thrice daily for 3 to 22 days. In every patient the number of microfilariae was greatly reduced by the second day of treatment; and in 13 microfilariae were not found 8–83 days after treatment. According to later, unpublished, information, a large proportion of the patients treated with the higher doses have remained free from microfilariae for over three months and may be considered as probably cured. These first results are very promising. No severe toxic symptoms have been observed. In normal healthy adults heavy dosage (8 mg. per kg. body-weight) may cause headache, general malaise, weakness,

pain in the joints, and anorexia; and these symptoms are presumably due to the direct action of the drug. In some patients, however, there was fever, tachycardia, leucocytosis with eosinophilia, and tender nodular swellings at sites which might well contain filarial worms; these disturbances are interpreted as allergic reactions to liberation of protein, through the death of microfilariae or adult worms.

## HYALURONIC ACID IN EFFUSIONS

HYALURONIC acid, a polysaccharide, was first isolated from the vitreous humour of the eyes of cattle and pigs, and from human umbilical cord, by Meyer and Palmer,<sup>1</sup> and has since been shown to be present in bovine and human synovial fluid,<sup>2</sup> pigskin,<sup>3</sup> and various tumours.<sup>4</sup> In 1940 Meyer and Chaffee<sup>5</sup> reported its presence in effusions due to malignant tumours involving the pleura or peritoneum, and later Campani<sup>6</sup> established that it is always to be found in inflammatory exudates. Campani and Schlechter,<sup>7</sup> utilising the capacity of testicular extracts to hydrolyse this polysaccharide, have shown that whereas the viscosity of inflammatory exudates is reduced and N-acetyl glucosamine liberated by incubation with testicular extract, no such changes take place when transudates are similarly treated; from which they conclude that though hyaluronic acid is present in the exudates it is absent from non-inflammatory transudates. This raises the question whether the hyaluronic acid in inflammatory exudates derives simply from breakdown of tissues containing the polysaccharide or as a true response by the body. In this connexion it is perhaps noteworthy that oedema fluid from guinea-pig's muscle artificially infected by injection of non-hyaluronidase-producing strains of *Clostridium welchii* also contains considerable amounts of hyaluronic acid.<sup>8</sup>

## ACUTE RHEUMATISM AND INFECTIVE ENDOCARDITIS

Two papers from Belfast<sup>9,10</sup> shed new light on the aetiology of rheumatic fever and subacute bacterial endocarditis. Many attempts have been made to reproduce the manifestations of rheumatism by sensitising animals to horse-serum and then giving a further dose of this serum; and lesions have been produced resembling those of rheumatic fever, though Aschoff in 1935 denied their identity with true rheumatic nodules. McKeown<sup>9</sup> has now produced such lesions by giving horse-serum (10 ml. per kg. body-weight) to rabbits, followed on the 17th day by 1 ml. intravenously to absorb circulating antibodies, and by a further 10 ml. 2 days later. These animals were usually killed 26 days after the first injection, but in another group of animals injections were given 4-weekly for 8 months. The resulting lesions, involving the paravascular tissues, the endocardium, and the valves, were histologically indistinguishable from those of acute rheumatism, and orderly progress was observed from a primarily necrotic process, through a typical cellular response, to healing. These experiments give strong support to the view that rheumatic fever is a hypersensitive reaction, though its relation to the haemolytic streptococcus remains uncertain.

Following Gross and Ehrlich, McKeown had previously tried to "date" rheumatic nodes by their histological structure. In the second paper MacIlwaine<sup>10</sup> confirms McKeown's work, and reports on histological studies in subacute bacterial endocarditis. Surprisingly, in many cases of subacute bacterial endocarditis, rheumatic lesions were found which had apparently existed for the same

1. Culbertson, J. T., Rose, H. M., Hernandez-Morales, F., Oliver-Gonzalez, J., Ortiz, L. F., Reyes, F. R., Nattal, R. *Trans. R. Soc. Trop. Med. Hyg.* 1947, 41, 18.
2. Williams, R. W., Brown, H. W. *Science*, 1945, 102, 482.
3. Hewitt, R. I., Kushner, S., Stewart, H. W., White, E., Wallace, W. S., Subbarow, Y. *J. Lab. Clin. Med.*, 1947, 32, 1314.
4. Santiago-Stevenson, D., Oliver-Gonzalez, J., Hewitt, R. I. *J. Amer. med. Ass.* 1947, 135, 708.

1. Meyer, K., Palmer, J. W. *J. Biol. Chem.* 1936, 114, 689.
2. Meyer, K., Smythe, E. M., Dawson, M. H. *Ibid.*, 1939, 128, 319.
3. Meyer, K., Chaffee, E. *Ibid.*, 1941, 138, 491.
4. Kabat, E. A. *Ibid.*, 1939, 130, 143. Pirie, A. *Brit. J. exp. Path.* 1942, 23, 20.
5. Meyer, K., Chaffee, E. *J. Biol. Chem.* 1940, 133, 83.
6. Campani, M. *Arch. ital. Med. sper.* 1942, 10, 305.
7. Campani, M., Schlechter, P. *Policlinico*, 1947, 54, 189.
8. McClean, D., Rogers, H. J., Williams, B. W. *Lancet*, 1943, i, 355.
9. McKeown, E. F. *J. Path. Bact.* 1947, 59, 547.
10. MacIlwaine, Y. *Ibid.*, p. 557.

time as the endocarditis; and from this MacIlwaine concludes that often in subacute, and less often in acute, bacterial endocarditis, *Streptococcus viridans* is attacking a heart affected by active rheumatic disease and not merely one with old rheumatic lesions. It has already been postulated that infective endocarditis somehow stimulates quiescent rheumatic nodules, but as MacIlwaine points out, there seems to be no reason why infection with a viridans streptococcus should activate rheumatic lesions caused by a hæmolytic organism, when other infecting agents do not do so.

#### FATTY LIVERS IN THE WEST INDIES

OCCASIONALLY human disease from dietary deficiency is seen in relatively pure form, and comparison can then be made with the lesions arising from the more easily controlled deficiencies in animal experiments. Waterlow's report on fatty liver disease in infants in the British West Indies<sup>1</sup> suggests that this condition is a distinct entity, which is observed in probably its purest form in that part of the world. The syndrome is one of a group of nutritional diseases affecting the very young—chiefly from just after weaning until the second year—which differs from the common deficiency states in three respects: the presence of fatty infiltration of the liver, a high mortality, and resistance to ordinary dietary treatment. The group occurs in tropical and subtropical Africa, America, Ceylon, China, and Haiti. The condition of "kwashiorkor," "infantile pellagra," or "malignant malnutrition," lately described in our pages,<sup>2</sup> is a closely related African counterpart, but in the West Indian disease the characteristic hair, skin, and mucous-membrane changes, probably associated with a B<sub>2</sub>-deficiency, are often absent.

Clinical studies of the West Indian syndrome were made in infants under two years in Trinidad, British Guiana, and Jamaica (where there are several hundred cases each year). The principal features were œdema, muscular wasting, and fatty infiltration of the liver. There was no hypochlorhydria; in the stools the fat content was increased (average 53.6% of dried weight) but the proportion of split fat was normal. There was some evidence that this hepatic condition may be the precursor of cirrhosis later in childhood. Related to social factors such as disruption of the family, the condition is attributed to prolonged feeding on a diet low in protein and relatively high in carbohydrate; and improvement took place with milk alone, once an adequate intake (30-40 oz. per day) was achieved. Controls were taken from a group of infants who showed no signs of fatty liver disease but were otherwise undernourished. Generally the infants with fatty liver disease showed a mean deviation from the West Indian standard body-weight of -32% as against a 50% loss in the control group; there was thus no direct correlation between liver damage and weight loss. The group without liver disease were being fed with porridge of maize, arrowroot, or meal and perhaps a little milk (5-10 oz. a day), whereas those with liver disease got very little—probably "bush tea" mainly. The œdema was found mainly in the feet and legs and was associated with considerable reduction of the serum-proteins; this reduction was greatest in the albumin fraction, and the albumin:globulin ratio was low. The loss of weight was due also to selective loss of muscle; this was particularly evident in the buttocks which consisted of little more than folds of skin and fat. The liver protein was reduced by about 25%. There was therefore gross depletion of the three main protein reservoirs—liver, muscles, and blood-plasma—all of which was attributed to low protein intake. Biopsy

specimens of the fatty liver commonly contained exogenous neutral fat, up to 25-50% of its fresh weight, as against 1.2-27.2% in the control group of babies dying of simple undernutrition.

In experiments on rats fatty infiltration of the liver has been produced by diets deficient in choline; and this is prevented or cured by the exhibition of choline and also by methionine and casein (which contains methionine). These and other experiments have shown that protein is lipotropic by reason of its methionine content acting as a donator of methyl groups for the synthesis of the choline necessary for the movement of fat to and from the liver. In the West Indian syndrome absence of response to pure choline and methionine in doses ten times as great as the amount of protein (as milk) which led to rapid disappearance of fat from the liver suggested that the lipotropic action of milk was here different to that in rats; the fatty liver in these babies was not the result of simple choline deficiency. In choline-deficient diets the accumulation of fat in the liver is reduced when the food intake is diminished or growth is suppressed, as by mineral deficiency; methionine not then needed for building body tissues is thus available for lipotropic activity. In the babies with fatty disease of the liver there is both continued growth and continued food (carbohydrate) intake. Thus a relatively high calorie intake, on a background of an otherwise deficient diet, favours the deposition of fat in the liver.

The evidence is therefore that protein deficiency is important in the pathogenesis of this syndrome, which seems to resemble very closely that noted by Véghelyi<sup>3</sup> after the siege of Budapest, where milk also produced dramatic improvement. Similar liver changes can be detected in dogs whose diet has been low in protein. All the substances found curative contain protein—crude liver extract, milk, and dried stomach. Waterlow points out that in protein depletion the active cell proteins are presumably reduced; some may be selectively lost, including those constituents of the enzyme systems concerned in fat transport and fat metabolism, and he concludes that the fatty liver disease should probably not be regarded as the result of deficiency of some substance as yet unknown. "This may, indeed, be the immediate cause; but the response is provoked and enhanced by three stress-factors: the metabolic demands of the growing organism; prolonged depletion of protein; and prolonged overloading with carbohydrate."

#### SMEAR TECHNIQUE IN GASTRIC CANCER

FOR victims of gastric carcinoma the chances of survival seem to be increasing. Surgical technique has become more radical, and its immediate mortality has been reduced. But the crux is still early diagnosis.<sup>4</sup> Responsibility for delay in diagnosis is shared alike by the patient, the "outside" doctor, and the hospital. Cooper,<sup>5</sup> for example, calculated that the average delay attributable to the patient is 8 months, to the doctor 4½ months, and to the hospital 1-6 months. Harnett<sup>6</sup> has lately estimated that 35.5% of patients do not seek advice until the lesion has existed for over 6 months; and 19% are treated symptomatically for over 3 months. Taylor<sup>7</sup> has pointed out that if, instead of saving 1 case in every 6 that reaches hospital, it were possible to save 1 in 3, no less than 3000 lives could be saved in this country each year. It is difficult to defend or excuse delay in diagnosis once the patient has been admitted to hospital; but despite investigation there remain a few cases where, though the history may be suggestive, the physician is insufficiently convinced to advise operation; even at laparotomy it is not always

1. Waterlow, J. C. Fatty Liver Disease in Infants in the British West Indies. *Spec. Rep. Ser. m.d. Res. Coun., Lond.* no. 263. H.M. Stationery Office. 1948. Pp. 84. 2s.  
2. Davies, J. N. P. *Lancet*, Feb. 28, p. 317. Holmes, E. G., Trowell, H. C. *Ibid.*, March 13, p. 395. Leading article, *Ibid.*, March 20, p. 451.

3. Véghelyi, P. V. *Ibid.*, March 27, p. 497.

4. See Shorter, A. *Ibid.*, 1947, ii, 842.

5. Cooper, W. A. *J. Amer. med. Ass.* 1941, 116, 2125.

6. Harnett, W. L. *Brit. J. Surg.* 1947, 34, 379.

7. Taylor, H. *Lancet*, April 17, p. 581.

easy to be sure whether a localised gastric lesion is simple or malignant, and the surgeon is then faced with an immediate choice between simple gastrectomy, on the supposition that the lesion is benign, and the more hazardous radical excision on the off-chance that the lesion is malignant.

The principle of cellular diagnosis developed by Papanicolaou<sup>8</sup> has been applied to gastric cancer by Graham and her colleagues<sup>9</sup>; and their experience suggests that this method may be of considerable value in bringing the patient earlier to operation, and in protecting the surgeon from uncertainty about which procedure to adopt. Gastric secretion is aspirated from the resting stomach and immediately centrifuged and the deposit is at once fixed. (Delay of over half an hour results in digestion of the cells which may thus become unrecognisable.) Fixation is achieved by immersion of the deposit, on a slide, for 15 minutes in equal parts of ethyl ether and 95% alcohol. The slide is then stained by Papanicolaou's method.<sup>10</sup> Malignant cells are often seen in groups; their nuclei are hyperchromatic and usually contain prominent nucleoli; there are no sharp cellular borders; and often the cytoplasm shows vacuolisation—a characteristic of adenocarcinoma. There are occasional single cells which can be identified as malignant; they have large hyperchromatic nuclei and little cytoplasm.

Of 50 cases examined 24 had cancer, and in 15 of these cancer cells were seen. In 2 cases the lesions were extremely early, and both were detected by this technique. All 24 cases were explored, and of the 7 cases with resectable lesions, the test had been positive in 5. Of 26 patients without cancer, the smear was reported positive in 1—a man with a benign gastric ulcer. The method has the great virtue of simplicity and it occasions no great hardship to the patient. Though too much must not be read into a negative finding, it seems that the risk of a positive finding in the absence of cancer is very small.

#### SCARLET FEVER IMMUNISATION

DURING recent years interest in active immunisation against scarlet fever has declined, owing, as MacKaye and Watson<sup>11</sup> remind us, to the present mildness of the disease, to its favourable response to sulphonamides and penicillin (to say nothing of scarlet-fever antitoxin), and to the numerous injections of toxin required to reverse the Dick test, with the possibility of general reactions during the process. To these reasons may be added another—recognition that scarlet fever is essentially hæmolytic streptococcal tonsillitis, the rash being merely incidental; therefore no antitoxic immunity will prevent the essential component of the syndrome. Exanthematous scarlet fever is notifiable and its victims are commonly subjected to considerable periods of isolation; and though epidemiologically dubious, it may be administratively expedient to immunise members of isolated or semi-isolated communities, such as nurses in fever hospitals and children in residential schools. A scarlet-fever toxoid, comparable with diphtheria toxoid in antigenic potency and freedom from toxicity, has long been sought; but Parish<sup>12</sup> thinks it certain that scarlet-fever toxin will not now be replaced by a satisfactory toxoid preparation. Attempts have also been made to improve upon the original Dick antigen. Thus, Farago<sup>13</sup> prepared a toxin-filtrate adsorbed to alum, claiming better results from smaller and fewer doses; and commercial preparations similar to his have been

used in eastern Europe where scarlet fever is still a disease of notable severity.

MacKaye and Watson now report highly successful results from the use of a refined scarlet-fever streptococcus toxin (*U.S.P.*) prepared by precipitation with tannic acid and resuspension with aluminium hydroxide; this toxin contains only one-tenth of the alum of alum-precipitated toxoids. Only three injections of 0.1 ml., at monthly intervals, are necessary; apparently, despite the progressive increase in skin test doses (s.t.d.) the volume injected remains constant. The aggregate of s.t.d. used was 13,750 for children and 8500 for adults. (The aggregate of s.t.d., with Dick toxin ranges from 80,000 to 100,000 distributed over 4 or 5 doses at weekly intervals.) A group of 61 Dick-positive student nurses were given the adult dosage intracutaneously; and 90% became Dick-immune two weeks after the last injection. Subcutaneous injection of the same doses in another group of 30 nurses produced a reversal of the reaction in 83%. In each series an additional dose of 6000 s.t.d. secured, with one exception, 100% of immunes. In a home for the feeble-minded 132 Dick-positive pupils were inoculated, those of 13 years and under receiving the child's dose. In this home the intracutaneous and subcutaneous routes were used alternately with reversal rates of 79% and 88% respectively; these were increased to practically 100% by an additional dose. No general reaction was observed, but intracutaneous injection tended to produce itching and soreness at the site, with persistent pigmentation and occasional central induration; the authors thus recommend the subcutaneous route. Since these studies were begun in 1945 there has been no case of scarlet fever among the immunised. But after all, the real menace, especially in children's institutions, is the hæmolytic streptococcus and not its erythrogenic toxin; it is the direct cause of otitis media and sinusitis and tends to produce sensitivity to the rheumatic antigen, whatever this may prove to be. Outbreaks of tonsillitis, with or without rashes, should lead to not only prompt isolation and treatment by chemotherapy but identification and typing of the causal organism and a search for carriers—particularly nasal carriers whom Hamburger and his associates<sup>14</sup> have found to be the dangerous sources of hæmolytic streptococcal infection.

#### WORLD HEALTH ORGANISATION

THE constitution of the World Health Organisation has now been ratified by Mexico and Byelorussia, bringing the total of ratifications by members of the United Nations to 27—one more than the number required to bring the constitution into force. The United States and France have not yet ratified the constitution. A World Health Assembly is to be opened at Geneva on June 24 and will continue until the end of July; and it is expected that the Interim Commission will be dissolved within a month of the end of this meeting. The whereabouts of the organisation's permanent headquarters is still undecided. The places suggested include Geneva, New York, Paris, Washington, and London, and of these Geneva has at present most supporters among the ratifying nations that have expressed a preference.

AN international conference on the Revision of the Lists of Diseases and Causes of Death has been held in Paris this week. Delegates from the United States and Canada held preparatory meetings in London, and on April 21 a reception was given for them at the General Register Office at Somerset House. The Minister of Health and the Registrar-General, with Mrs. Bever and Mrs. North, received the guests.

8. See leading article, *Ibid.*, Feb. 28, p. 330.  
9. Graham, R. M., Ulfelder, H., Green, T. H. *Surg. Gynec. Obstet.* 1948, 86, 257.  
10. Papanicolaou, G. N. *Science*, 1942, 95, 438.  
11. MacKaye, L. G., Watson, E. H. *Amer. J. Dis. Child.* 1948, 74, 711.  
12. Parish, H. J. *Lancet*, 1947, II, 413.  
13. Farago, F. *Dtsch. m.d. Wschr.* 1941, 67, 837.

14. Hamburger, M. jun., Green, M. J., Hamburger, V. G. *J. infect. Dis.* 1945, 77, 96. Hamburger, M. jun., Lemon, H. M. *J. Amer. med. Ass.* 1946, 130, 836.

## Special Articles

### PROPRIETARY MEDICINES

#### STANDARDS IN ADVERTISING

IN 1945 the Advertising Association set up a committee to prepare a unified code of standards in the advertising of medicines and treatments; and the code, now published, has the support of the Newspaper Proprietors Association, the Newspaper Society, the Periodical Trade Press and Weekly Newspaper Proprietors Association, the Advertising Association, the Incorporated Society of British Advertisers, the Institute of Incorporated Practitioners in Advertising, and the Proprietary Association of Great Britain.

There are already statutory restrictions under the Venereal Diseases Act, 1917, the Cancer Act, 1939, and the Pharmacy and Medicines Act, 1941. These Acts forbid advertisements relating to venereal diseases, cancer, Bright's disease, cataract, diabetes, epilepsy, fits, glaucoma, locomotor ataxy, paralysis, tuberculosis, and the procurement of abortion.

The provisions of the code, which are summarised below, do not apply to an advertisement published by a Government Ministry or department or by a local authority, nor to an advertisement addressed to registered medical or dental practitioners, registered pharmacists, or registered nurses.

#### GENERAL RECOMMENDATIONS

**Cure.**—No advertisement should contain a claim to cure any ailment or symptoms, nor should an advertisement contain a word or expression used so as to mean in the positive sense the extirpation of any ailment.

**Illnesses requiring medical attention.**—No advertisement should contain any matter which can be regarded as an offer of a medicine, product, or advice relating to the treatment or relief of serious diseases which should rightly receive the attention of a registered medical practitioner.

**Misleading or exaggerated claims.**—No advertisement should contain any matter which directly or by implication misleads as to the composition, character, or action of the medicine or treatment advertised or as to its suitability for the purpose for which it is recommended.

**Appeals to fear.**—No advertisement should be calculated to induce fear in the reader that he is suffering, or may without treatment suffer or suffer more severely, from an ailment.

**Competitions.**—No advertisement should contain any prize competition or similar scheme. Such advertisements may constitute an offence under section 26 of the Betting and Lotteries Act, 1934.

**Diagnosis or treatment by correspondence.**—No advertisement should offer to diagnose by correspondence diseases or symptoms, or request a statement of symptoms with a view to advising on or providing for treatment by correspondence. Nor should any advertisement offer treatment by correspondence.

**Disparaging references.**—No advertisement should directly or by implication disparage the products, medicines, or treatments of another advertiser or manufacturer, or of registered medical practitioners.

**Money-back offers.**—No advertisement should offer to refund money paid.

**College, clinic, institute, laboratory.**—No advertisement should contain these or similar terms unless an establishment corresponding with the description used does in fact exist.

**Doctor, hospitals, &c.**—No advertisement should contain any reference to doctors or hospitals, whether British or foreign, unless such reference can be substantiated by independent evidence and can properly be used in the manner proposed. No advertisement should contain in the name of a product the term "doctor" or "Dr." unless the product was so named before Jan. 1, 1944.

**Products offered particularly to women.**—No advertisement of products, medicines, or treatments for disorders or irregularities peculiar to women should contain the following or similar expressions, which may imply

effectiveness in inducing miscarriage: "female pills," "not to be used in cases of pregnancy," "the stronger the remedy the more effective it is," "never known to fail."

**Illustrations.**—(a) No advertisement should contain any illustration if the reasonable inference to be drawn therefrom comes within any of the restrictions of this code; and (b) illustrations in advertisements should be in good taste and should not be distorted or exaggerated to convey false impressions.

**Magic, magical, miracle, miraculous.**—No advertisement should contain these terms.

**Natural remedies.**—No advertisement should claim or suggest, contrary to fact, that the article advertised is in the form in which it occurs in nature or that its value lies in its being a "natural" product.

**Special claims for drugs and chemicals.**—No advertisement of drugs or chemicals should contain any reference which is calculated to lead the public to assume that the article or treatment advertised has some special property or quality which is in fact unknown or unrecognised.

**Sexual weakness.**—No advertisement should claim that the product, medicine, or treatment advertised will promote sexual virility or be effective in treating sexual weakness, or habits associated with sexual excess or indulgence, or any ailment associated with those habits.

**Premature ageing, impaired vitality, loss of virility.**—These and similar expressions may be understood to mean sexual weakness and the recommendations under that heading may apply.

**Tonic.**—The use of this expression in advertisements should not imply that the product or medicine can be used in the treatment of sexual weakness.

**Testimonials.**—No statement or implication should be allowed to appear in a testimonial which would not be permitted in the text of the advertisement. In any case no advertisement should contain a testimonial other than one limited to the actual views of the writer, nor any testimonial given by a doctor other than a registered British medical practitioner unless it is obvious in the advertisement that the writer is not a British medical practitioner.

#### FORBIDDEN SUBJECTS

No advertisement should contain any matter which can be regarded as an offer of a medicine, treatment, or product in relation to any of the following:

Alopecia, amenorrhœa, diseased ankles, arteriosclerosis, artery troubles, arthritis, baldness, barber's rash, blood disease, high or low blood-pressure, convulsions, dermatitis (all forms), disseminated sclerosis, ears and eyes (any organic defect), fungus infections, gallstones, goitre, heart symptoms, impetigo, indigestion (chronic or persistent), insomnia (chronic or persistent), itch, kidney diseases, lazy eye, leg troubles, bad or painful legs, lupus, menopausal ailments, obesity,\* osteo-arthritis, prolapse, purpura, pyorrhœa, rheumatism (chronic or persistent), rheumatoid arthritis, ringworm, scabies, scaly eruptions, sclerosis, skin diseases, slimming,\* squint, sycosis, ulcers (gastric or duodenal), varicose veins.

### SOME SOCIAL FILMS

THE Central Office of Information has a plan to make legislation comprehensible by means of the colour cartoon. Two new films of a series—the first dealing with town-planning, the second with the National Health Service—have been completed, and as far as technical achievement goes they are decidedly successful. They will be shown in most of the ordinary cinema programmes throughout Great Britain.

The central character is Charley, who is both the victim of our failure to provide good social conditions and the advocate of the reforms introduced by the Acts. This is the weakness of the films, for it entails presenting all the proposed changes in rosy light, and overlooking any possible hitches. The results are uncommonly like propaganda based on the theory that everything is for the best in the best of all possible States. Something must be allowed for the fact that one cannot tell everything in a ten-minute cartoon; but a word of caution to the effect that towns and

\* The restriction does not apply to offers of physical exercise courses or to articles used for the purpose of physical exercise.

health services which look pretty in the plans take time and good will to build would not have come amiss.

*New Town* contrasts the crowded quarters, the poor transport, and the dirt and squalor of an industrial town with the amenities of a new town properly planned—a reversed plan of Stevenage serving as the model town. There are some pretty and amusing touches—Charley's uncomfortable bus-ride to work, the growth of the industrial town from a tiny pleasant village, the children seen from above as black specks trickling through the new clean roads with their grass verges into the new clean school—while from time to time the familiar voice of Colonel Chinstrap, pleading for an adequate number of pubs ("all next door to me"), restores some sense of reality. It is almost the only hint in the film that human nature is imperfect.

*Your Very Good Health* can only leave doctors depressed. The model of a health service here displayed is groomed and streamlined, whereas the real thing, even if driven by that notoriously restricted source of power, "the best will in the world," is bound, for many years to come, to be ramshackle. But the intentions of the Act, at all events, are set out tellingly and cheerfully, and the designers of these cartoons—John Halas and Joy Batchelor—deserve great credit for ingenuity, speed, and humour.

#### "YOUR CHILDREN"

Two films in another series are noteworthy. *Your Children's Meals*, intended for showing to parents, not children, was reviewed in our columns last year.<sup>1</sup> *Your Children's Sleep* is intended for showing in ordinary cinemas. It begins with two wakeful adults—one disturbed by anxiety, the other by excitement—and goes on to the causes of wakefulness in children. Anxiety, yes; excitement, yes; but anxiety and excitement from causes which seem so odd and inadequate to the grown-up in charge. The anxious little girl who fancies she has sneaked on her friends, the child who is afraid of a new teacher, the small boy who cannot relax from the relentless press of his fantasies, the girl who cannot reach the standard her mother sets her—these lie awake, and their parents can only guess at the reasons. The film is well done, especially where the children are acting their fears and worries; but a symbolic device to explain what happens is not quite successful.

Monstrous black shapes move about a chess-board, and their advances can only be stemmed by the placing of tiny white pieces—presumably the forces of reason and self-knowledge. The adult has had some practice in placing his pieces, and can control to some extent the black anxieties which would break his rest, but the child has no such skill. The message is that they must be placed for him by his parents—by the reassuring word, the bedside story. But the black shapes loom so large, and the defensive pieces are so tiny and foolish-looking, that the cause appears lost from the start. A little more imagination would have given the defenders the form of jovial knights on stout horses, well-battlemented castles on legs (like those in *Through the Looking Glass*), or other heartening devices. In any case it is not quite clear whether the placing of defences is the best method of dealing with bedtime anxieties. It would have been more satisfactory to see the black shapes melting into mist as the parents' insight grew.

#### FIRE

*Playing with Fire* is a truly, and properly, horrifying film. Accident follows grim accident, while an impersonal voice gives the names and ages of the children and tells what led up to the disaster. At the end, the camera travels up a scarred body till it reaches the face of the little girl we have just seen reaching, in her flannelette nightgown, for a book on the mantelpiece above the nursery fire. The ambulance bell and the wailing of a burnt child gain in significance with each repetition.

The film is for showing to parents, at special sessions arranged by local authorities. It reminds them that 600 children are killed yearly from preventable burns, and that 12,000 burned children are yearly admitted to hospital. The warnings are reinforced with useful advice: fireguards are needed for electric as well as coal fires,

and also for the flexes of gas rings. Bowls of hot fat should go on a high shelf, saucepan handles should be turned away from the edge of the stove, cloths should not temptingly overhang the table edge, cups of hot tea should not be moved too closely behind the shoulder of the unattending child, nightgowns should cling to the body. These messages are given well.

Introducing this film Mr. John Edwards, Parliamentary Secretary to the Ministry of Health, noted that in making it the Central Office of Information had had the help and advice of Dr. and Mrs. Leonard Colebrook and the staff of the Birmingham Accident Unit. Mrs. Colebrook had analysed the history in 734 cases of burns admitted to the unit over three years. The accidents had been responsible for 27,000 bed days, and 7 out of 10 of them had been preventable.

The Central Office of Information publishes a list of sound films on health which are shown free of charge by their mobile film units at the request of local authorities and suitable groups and organisations.

## TUBERCULOSIS IN THE REGIONS

REGIONAL hospital boards are now considering their tuberculosis schemes, and the council of the National Association for the Prevention of Tuberculosis has issued the following recommendations for their consideration:

1. Each regional hospital board should have a permanent committee, consisting of members of the board and co-opted persons, whose function would be to co-ordinate the control of tuberculosis together with that of major respiratory conditions, with the ultimate object of creating a complete service for tuberculosis and chest diseases.

2. In many cases the chief medical officer of the regional board will appoint a medical committee of members of his own staff to give him specialist advice. This should be very helpful. Seeing, however, that non-medical opinion is so important a part of the campaign against tuberculosis, the N.A.P.T. considers it desirable that general policy should be regulated by a special committee of the board.

3. To assist the chief medical officer in carrying out the policy of this committee the region should have a doctor of high clinical and administrative ability, working either whole-time or part-time, to co-ordinate the services of tuberculosis and chest diseases, and secure a high standard of treatment and care.

4. Under existing tuberculosis schemes (which end on July 5), prevention, treatment, and social welfare are under one authority. In future these responsibilities will be divided, and every expert on the problem will agree that a high degree of united effort is the heart and soul of the tuberculosis scheme of the future. The tuberculosis specialist (or physician), who will be responsible both to the regional board and the local health authority, should have every possible support in combining modern treatment of his patient with a high level of care and aftercare of the tuberculous family.

5. Even before the present acute shortage of beds for treatment, certain groups of tuberculous patients were comparatively neglected through the absence of specialist facilities which modern advances show to be necessary. . . . The following aspects of the disease seem to merit special consideration: (a) the treatment of *combined lesions*, that is, patients whose clinical tuberculosis appears in more than one organ at the same time; (b) *genito-urinary tuberculosis*, a most distressing form, which requires close collaboration and prolonged care by both physician and surgeon; (c) *tuberculosis in children*, apart from those cases of ~~bone~~ bone and joint conditions which come under the orthopaedic department; and (d) *tuberculosis in pregnant women*, for whom the obstetric specialist and tuberculosis officer are both responsible.

6. Under the new health scheme, health education becomes the statutory duty of the local health authorities, but the N.A.P.T. believes that, from many points of view, special propaganda will be necessary to popularise those services in clinics, sanatoria, and other institutions which the regional hospital board provides. . . . The N.A.P.T. offers to regional hospital boards as well as local health authorities the services which for 50 years have been available to their predecessors in the tuberculosis field.

1. *Lancet*, 1947, II, 778.

## Disabilities

### 3. DISSEMINATED SCLEROSIS

ON the advice of a London neurologist (consulted for reasons I have now forgotten) I spent each winter from 1921 to 1926 in North Africa and Portugal. It was at Cintra, probably in 1923, that I discovered that when swimming breast-stroke I was unable to advance, but swam round in circles. I also found it difficult to go down the path cut in the cliff, and after a few falls I used to take the easier way round to get to the shore. I could no longer play tennis; I used to fall over my feet and the ball frequently knocked my racquet out of my grasp.

From 1926—the year in which I had a baby, who only lived a few hours—till 1930 I lived in India. There I had malaria quite badly about twice a year but was otherwise remarkably fit and even lost the unpleasant tired feeling that had for some years rarely left me. Returning to London and Scotland in 1930 I soon became again permanently tired and unsteady on my feet. I realised after a last bad fall that I must even give up riding, and at the end of 1931 I went to live in France, disgusted at being unable to lead the kind of life I had always led. The same London specialist I had before consulted advised injections of arsenic and told me I was “run down.” I cannot believe that so eminent a man did not know that I had disseminated sclerosis, and I suggest that if he had been more truthful with me he would have helped a great deal—morally at any rate. The fact that I felt ill and that this specialist of repute took no notice of my complaints engendered a fear of being thought a *malade imaginaire*—a fear I have retained to a certain extent ever since. It often prevents me talking of my aches and pains as soon as might be helpful to my attendant physician, sometimes with unfortunate results, as when I had appendicitis.

Accordingly I muddled through the winter of 1930–31; but in May my bladder refused to act normally, and I was forced to call in the local doctor, who insisted on my consulting a neurologist in Paris. By this time my left arm and left leg were uncoöperative in every way, and from being left-handed I was obliged to learn to use my right hand. This French neurologist (Dr. X) diagnosed disseminated sclerosis, dating back ten years he thought. I grew gradually worse, but afraid of just being told I was “run down” I refused to consult a doctor. I rarely took a step in public because I reeled like a drunkard. I spoke very indistinctly and was unintelligible on the telephone; my vision was double or blurred; my left hand could not grip, and even my right hand trembled when I stretched it out. My bladder became incapable of emptying itself, for periods of from three days to three weeks. Early in January, 1938, I practically lost the use of my left side and had great difficulty in swallowing; and for about 48 hours at a time I had the most appalling pain in the back of my head. Dr. X, summoned from Paris, prescribed daily intravenous injections.

I spent four months in bed, not trying to get up, indifferent to everything and everybody. As Dr. X so aptly said, “You are just turning your face to the wall.” But I did not care until a trifling incident awoke my sense of humour. I was already speaking more distinctly and seeing more clearly; I could move my left arm and leg easily, and my bladder was normal intermittently. I think I made my first real effort when I realised that Dr. X, a very busy man in charge of Paris’s neurological hospital, was coming 30 miles in the evening every week to see me. The following week I went to Paris by car to see him.

I owe a tremendous debt to this doctor. By his frankness and his refusal to allow me to give in to

physical disabilities he saved me from a miserable half-paralysed existence. In July he took me to his hospital, showed me advanced cases of disseminated sclerosis, and made me notice the exact state of several patients who had improved remarkably under the same treatment I was having. He showed me these patients again on my return from the south of France in October that year; he showed me others who did not respond to treatment; then he showed me myself, and I was forced to agree that there was a great improvement in every way. He bade me use a stick when walking alone, which he asked me to do for twenty minutes a day in the street. This he said would help me not to fall as I used to do when I lost the notion of the position of my left leg; he told me also to knit so as to re-educate my hands and fingers. For the next year I led a normal life, except that from being a woman nobody could tire I joined the ranks of the ever-tired and ever-cold.

### THE WAR

At the outbreak of war I went to the most westerly point of Brittany with my French cousin and her children. The winter passed uneventfully; in the spring of 1940 came the stream of refugees with the Germans on their heels. We had a house in a tiny seaside village whose large hotels were soon crowded with miserable refugees. There were few women and no men willing to cope with this horde, and that was when I started overtaxing my unwilling limbs. From May till September, 1940, I worked really hard, dealing especially with the poor frightened children and women, spending my spare time telling them fairy-tales of England’s wonderful reserves which she would use in good time to beat the Boche. Then having sent all the refugees back to their homes, by order of the Germans, we ourselves returned to Melun and Bois-le-Roi.

I was nearly at the end of my tether, walking very drunkenly, stuttering, and so on. At dawn on Dec. 5, 1940, I was arrested by the Germans. Three nights and two days in a wooden railway truck and a few well-directed kicks from German jackboots on the way to a concentration-camp finished my resistance, and the next time I became aware of my surroundings I was in the camp hospital with my left side completely paralysed and all the other symptoms of an onslaught of disseminated sclerosis. After a few days I was able to make myself understood by the French military doctor—a prisoner as I was. By divers means, starting with the bribing of a German sentry, this willing but avowedly incompetent doctor communicated with Paris and Dr. X. I never lost my moral energy this time, and spent night after night for many weeks endeavouring unsuccessfully to move my left arm and leg. By March, 1941, I could sit up, but this the Germans never knew. When the German doctor came round I could neither speak, hear, nor move. Consequently they invalidated me out of the camp back to where I came from.

Immediately Dr. X came to see me. His wife, an Englishwoman whom I had known for many years, was in Free France, and this loyal French doctor inspired me with the hope of being useful in occupied France; and that, I am sure, speeded my recovery. By the spring of 1942—eighteen months after my collapse in the concentration-camp—I was able to get about. This the Germans discovered only just before the liberation, and I obtained permission to do or leave undone many things on account of a paralysed left side.

By now I had organised a veritable factory for forging identity papers. This was working well; but the difficulty with my bladder was an obstacle to my getting away to do intelligence work until Dr. X solved the problem. He taught me how to use a catheter myself, and after a little practice under his direction I became an expert at this rather difficult manoeuvre and can still

dispense entirely with any aid in looking after my bladder.

The next question was a means of locomotion. Lack of coördination in movement hampered my walking. Dr. X therefore decided that I should ride a bicycle. I was probably helped in this by the fact that when young I was a real acrobat on a bicycle. Dr. X tied my left leg to a splint; thus I learnt to rely on my good right leg and to avoid many falls. He taught me how to stop the violent shaking of my left foot which was started by any sudden pressure on the pedal; he gave me an eye-shade to wear, first over one eye and then over the other, so that I should not see double; next he fitted up a box with all the instruments necessary for giving an intravenous injection, together with ampoules and a covering letter to a Dr. Y. Thus equipped, I was able to take on various identities in different places. It was by now October, 1942. R.A.F. and American airmen were falling fairly thickly over France and a difficult part of the organisation of the various lines of escape for these men was to verify that they were not Germans posing as R.A.F. or U.S.A.A.F. men. Since I was English I was one of the few people capable of carrying out these verifications, and my bicycle, my false papers for these men, and myself were in great demand.

Airmen baled out in the most remote places, and I was often away for several days. I usually managed to take a train to within a short distance, and with my cycle in the luggage-van, ready to use when trains failed me, I covered incredible distances for a supposed invalid. As time went on and Allied bombing destroyed the railways, the distances I had to travel became greater, and finally we were forced to bring the men to Paris or its suburbs before vetting them. At that time I had the running of a secret arms and munitions dump 35 miles from my home, and important work in Fontainebleau and Paris in addition to the airmen. Locomotion became a real problem. To cover the necessary 35 miles by road every time arms were to be received or distributed from my munition dump, I used to start about 6 P.M. and cycle 5 miles to friends where I lay flat and motionless for an hour. Then I dined and afterwards cycled another 6 miles through the forest to Fontainebleau where I stayed the night, had an intravenous injection, and used my catheter if necessary. The next morning 6 A.M. saw me on the road. The first two laps, with an interval of an hour lying on my back in a field, used to go well; after that I slowed down and it was about 5 P.M. before I reached my destination. After sending round to helpers I usually had about four hours' rest, and then a very strong bowl of 'Ovaltine' prepared with milk by the priests at the seminary where the arms were dropped, for I was too tired to eat. I walked half a mile through the woods to a clearing, and again rested for about four hours before the work of the night began. I only looked on—at the most flashing a light for signal—and by 6 A.M. was ready to take the road again if necessary. Sometimes it was possible to spend twenty-four hours on my bed at the tiny hotel where I had a room; I usually slept until late afternoon and woke up very hungry, went up to the seminary and had an enormous meal, and drank with the priests to the damnation of all Boches; then back to my bed where I usually slept again the whole night. Whenever I had a day's leisure in front of me I used to take a pretty strong dose of a barbiturate in accordance with Dr. X's instructions.

After the invasion things speeded up so much that I used rarely to get a whole night in bed, and I became so tired that I used often to go along the road in a kind of daze, often falling off my bicycle, but not really hurting myself. On several occasions I found myself saying aloud: "Leg, push the pedal, leg, push the pedal," to a rhythm! In fact, I used to wonder whether my wits

or my body would give out first. But the Allies saved them both.

#### THE PRESENT DAY

After it was all over and I was back in England, I was ill for some months. Being useless, I went back to Bois-le-Roi and spent some more months recuperating. Now I lead a fairly normal life, except that I still belong to the ever-tireds. I fall about and my bladder is a great nuisance as it has periods of emptying itself without warning. My present doctor advised me to empty my bladder with a catheter when this happens. This has proved very good advice and I use the catheter about an hour after breakfast, at which I drink a good deal. Then I wear a pad from lunch-time onwards so that when I start passing water without warning the pad gives me time to get to a lavatory.

I think the reason why I do not usually hurt myself when I fall is that I do not try to redress my position; when I see myself falling I relax all my limbs, only guiding my fall if I see a dangerous obstacle in the way. Relaxed limbs crumple up and hit the ground much less forcibly than stiffened limbs. I find turning corners difficult unless done slowly, and stairs are a great trial and a great fatigue.

## Medicine and the Law

### Police Doctor's Evidence

THE High Court decision in *R. v. Nowell*, reported in the *Times* of April 20, will be reassuring to practitioners who are called to a police-station to examine a motorist for symptoms of alcoholic poisoning. The motorist concerned, convicted at Cambridge Quarter Sessions of dangerous driving and of driving while under the influence of drink, appealed against his conviction on the main ground that the police doctor's evidence against him had been inadmissible. The accused had been taken to the police-station (after the car had been observed to be proceeding on the wrong side of the road and without lights) and what Mr. Justice Humphreys described as "the ordinary procedure" was carried out. A police doctor was sent for. When he arrived, he informed the motorist that, if he wished, he could have his own doctor. The motorist replied that he had never had a doctor in his life and he did not want to be examined. The police doctor persuaded him by pointing out that an examination might be to his advantage. Some familiar tests were applied. The motorist was asked to walk along a chalked line, and to touch his nose while keeping his eyes shut. The doctor came to the conclusion that he was drunk and unfit to drive; he gave evidence to that effect at the trial, which ended in a fine of £50 and a year's disqualification from driving.

Did the police doctor's efforts to persuade the motorist to be examined vitiate the test and make the evidence thereof inadmissible? There is on record, of course, the dictum of Mr. Justice Rigby Swift at Liverpool assizes in 1934 that a police surgeon has no right to apply tests for drunkenness without the consent of the accused. And, if that consent is obtained by something in the nature of an inducement, one is at once reminded of well-known judicial declarations that any kind of admission or confession "forced from the mind by the flattery of hope or by the torture of fear... comes in so questionable a shape" that evidence of it must be rejected. Evidently the High Court did not think that the police doctor had on this occasion done anything to flatter hope unfairly, although, as the textbooks show, any admission obtained by such words as "it will be better for you to speak the truth" is disallowed. To tell a motorist that he had better allow an examination clearly falls far short of impropriety. Mr. Justice Humphreys declared that the doctor had behaved perfectly reasonably. The principle which excluded evidence of a confession extorted by means of promises or threats had nothing to do with this case. The police doctor's evidence "should be accepted like that of any other professional man." It must be presumed that he came before the court with no other desire than to assist.



## In England Now

### A Running Commentary by Peripatetic Correspondents

"WHAT colour were the horses?" asked Robert, as we climbed in from the balcony. "Cream," I ventured. "Grey," said Ellen. "Bay," said Ian. But we agreed that the Queen and Princess Margaret looked fine in blue and that Princess Elizabeth had a blue hat. From where we stood the men in the carriages, in their nautical kit, formed a dark background for the womenfolk. But it was the Life Guards and the outriders that made us realise what a lot the viewers (if that's the word) were missing by seeing it all in black and white. The brass and silver can never have been shinier, nor the scarlet and gold more glaring, than on this brilliant spring morning. Even the dreadful architecture of the north side of the Strand was mercifully hidden by bunting. Altogether a fitting picture to be stored away in our memories and brought out—with the colours a bit muddled and even the *dramatis personæ* a trifle vague—for comparison with the Golden Wedding procession.

\* \* \*

I was determined to pay my respects to Æsculapius at Epidaurus this Easter, and in spite of discouragement on all sides my wife and I have done so and returned.

The journey from Athens to Corinth on Good Friday was without incident, but from there to Argos our train was preceded by an armoured one, consisting of two trucks to explode the mines, the locomotive, then a tank on a truck, and finally a closed wagon full of soldiers. At Nauplia we were the only guests in that most romantic of all hotels, Bourtzi or the Executioner's Rest, the 13th-century Venetian fortress on a rock in the harbour where later the public executioners of Greece were kept secure from popular vengeance. It was still March, but I had a magnificent bathe in emerald water not excessively cold, though the price was a palm full of sea-urchin prickles.

Next day we hired a car to Epidaurus, as the bus went one day and returned the next. We were the sole visitors, with not even a guide to bother us, and we wandered at will among the splendid ruins, carpeted with grape-hyacinths and scarlet anemones. After admiring the theatre, capable of holding 14,000 but actually tenanted by three goats in the fifth row of the dress-circle, we reconstructed the Grand Hôtel d'Asclepios et de l'Univers, where my wife swore she identified the reception desk and I the toilets; the Temple and the Pantiles; the spring itself, guaranteed to restore, *inter alia*, ruptured bladders and lost virginities (I took away a chip, as one never knows); the Rotunda, whose purpose is still unknown; and the Stadium with a vaulted tunnel from the dressing-rooms out of which the competitors must have pranced exactly as one sees English football teams emerge, and where the stones forming the starting line still show the places where the runners took a grip with their bare feet. (Incidentally, how has the winged caduceus of Mercury with the two snakes crept in, for example, to the badge of the U.S. Public Health Service? There can be no possible doubt that Æsculapius had one snake climbing up a wingless staff.)

The journey back to Athens on Easter Sunday was a bit of a nightmare—cold, rain, packed third-class carriages with wooden seats, whose windows fell down every time a door was opened, and 9½ hours to do the 97 miles. But no bandits, and it was worth it.

\* \* \*

Those who work in hospitals live rather like the birds and insects, who share our world without paying much attention to us, being engaged in their own pursuits. As residents, many of us had an itch to put down a record of that curious life, at once artificial and human, in the belief that it would do the rest of the world good to hear about us; and at a guess that is what happened to Ena Lamont Stewart, when she sat down to write *Starched Aprons*, recently playing at The Embassy. Her scenes in a Glasgow hospital carry the hall-mark of accuracy, and were played as well as only a first-class

repertory team knows how to play. Even the smallest parts had been studied as a problem in acting, and the best performance of all was that of the hospital porter in his cups: no porter ever hiccuped with a better grace—not even Macbeth's. But more goes to the writing of a good play than faithful reporting; and though Miss Stewart's study of a martinet sister began convincingly, it lacked depth. "How did she get like that?" ask nurses and audience alike. The nurses, with Freudian simplicity, put it down to frustrated sex; and the martinet herself evidently feels that was a good part of the trouble—indeed she hints as much in a cosy chat with another sister. However, it appears, in the last act, that all can be put right by a permanent wave and a few months at the seaside—treatment prescribed (perhaps not surprisingly) by a surgeon. Martinets are a fascinating study, and well worth a play wherever they crop up; but they are intricately made, and supremely difficult to unmake, their malady being built into the character at many levels. They can't be packed up in quite such a small neat parcel as this.

All the same, anyone who has worked in a hospital would enjoy this play; it brings back the sights and sounds—almost the smell—of the place. Moreover it reminds us that—despite hospital boasts of "improved conditions"—nurses off duty in their own sitting-room are still expected to rise when a sister comes in; that a medical superintendent can come into that room and order the removal of a light without one word of greeting or apology to the company assembled there; that nurses are young growing people whom hospital food often leaves hungry; and that even those who have taken their State examination are short of money. All this was worth saying, and it was said very well.

\* \* \*

Your peripatetic correspondent of April 17 who referred to the "monstrous regiment of women" was guilty of a misuse of the term which I, as a feminist, cannot pass unchallenged. When John Knox wrote under this title he did not mean to censure woman in the mass—indeed the evidence shows that he was most appreciative (it has been said too appreciative) of the fair sex. Knox's word "regiment" can be replaced by rule. He was fulminating against the personal interest in government taken by Queen Mary of Scotland. Knox was passionately convinced that however able a woman might be in activities "proper to her sex," the high matters of State policy were clearly outwith her competence. Today if any man did hold such a fantastic idea privily he would wisely stay mum. John lived in a sterner and more outspoken age. He said what he meant in as nice a bit of invective as you could find in a long search of the British Museum shelves.

\* \* \*

Completion of the financial returns for 1947-48 brought a sense of relief and satisfaction. It was time now to decide what I was going to do in the near future. My 65th anniversary falls due shortly, and so does my annuity. My early years were spent under pioneering conditions in tropical and subtropical surroundings, and I have had no genuine holiday since I settled in general practice in England. To reach a firm decision, before coronary thrombosis decides the matter, is not easy.

I decided, as before, to procrastinate, and with the aid of the current weekly medical journals settled down to the comfort of a 3s. 6d. packet of cigarettes and my own fireside. Alas, I read an advertisement requiring a medical officer in the interior of British Guiana. I read on with avidity. It appeared just the thing I have been wanting for the last 30 years. It would involve living in tents or under a tarpaulin in the forests bordering on Brazil. It would include opportunities for anthropological research.

All this is just what I am sure I was made for, but unfortunately I am 30 years too old. Like a phantasmagoria, I see the evergreen giants of the forests, and the floating cloud of smoke from the fires over which the meat is roasting. Nearby lie my notebooks and firearms. It was good to be alive.

## Letters to the Editor

### THE NURSE IN PREVENTIVE MEDICINE

SIR,—On all sides it is agreed that in the new health service the number of medical practitioners will not be enough for the medical service unless large panels are allowed. Few will wish this overloading of the general practitioner to continue for longer than is absolutely essential.

In order to eke out our slender resources, it will be necessary to use medical auxiliaries to the full. The most important of these auxiliaries is the trained nurse. It is curious that in spite of the long and exacting course to which the English trained nurse is subjected, she is allowed so little latitude in her medical relationship with patients compared to the freedom allowed to nurses in some other countries.

Whilst part III of the Act contemplates the use of the health visitor as a link between the practitioner, the patient, and the local authority, it is not suggested that she do more than advise the patient or report upon the family circumstances to the health authority. This can only result in still more work for the practitioner. In hospital work a great deal of patient supervision and treatment is carried out by ward sisters and staff nurses. A different picture is presented in general practice, as part of the financial value of a practice depends at present upon the doctor carrying out simple routine treatments himself. Under part IV of the Act this aspect of practice value will of course grow less, and the general-practice relationship will inevitably become more closely akin to the hospital relationship. It is vital that the trained nurse who is to act as a medical auxiliary should have no lowering of her standard of training; the numbers of such nurses available for work in conjunction with general practitioners should be increased, and no legislative action should impede the use of them.

Under section 28 of the Act, provision is made for immunisation against infectious diseases; but this section precludes the use of trained nurses for this work. Now, experience over many years has shown that the simple injection required for diphtheria immunisation can easily and properly be given by health visitors, who are also trained nurses, and it would certainly appear to be unwise to discard all the valuable help they have given in the past and which they could give in the future under schemes of mass protection. It is certain that practitioners will not be paid for this routine work except for a small fee for a certificate; it is almost certain that the number of immunised will be less in the future if reliance has to be placed upon overloaded general practitioners; and it is to be hoped that an amending Act will include powers to utilise the services of the trained nurse as widely in preventive medicine as in the hospital services.

W. G. BOOTH  
County Medical Officer.

Boston, Lincs.

### DISTRICT NURSING

SIR,—The appreciative contribution by one of your peripatetic correspondents on the value of district nurses is an encouragement to all connected with the Queen's Institute of District Nursing. Their work is particularly important, as the writer shows, in the rural areas, though their services are equally needed in urban districts. In answer to the questions raised in the article as to the future under the National Health Service Act, it is reassuring to learn that the representative bodies of the local authorities concerned with establishing a home nursing service recognise the value of the Queen's Institute, both as a training body and as a factor in the maintenance of a high standard of nursing service. In the discussions which have been taking place the good will shown by the representatives of the local authorities justifies a confidence that a sound and working partnership will be established between them and the Queen's Institute as the only national body providing and training district nurses. Naturally there will not be one uniform plan of co-operation throughout the whole country, but the standard of care of patients—the

primary concern of all parties—which has been the hall-mark of the Queen's Institute for sixty years will permeate this important portion of the National Health Service.

C. E. A. BEDWELL  
Chairman, Metropolitan Federation of  
District Nursing Associations.

London, S.E.24.

### WELSH ASSOCIATION OF HOSPITAL MEDICAL OFFICERS

SIR,—An association of full-time hospital medical officers has been formed within the Welsh region. In the past the interests of hospital medical officers have been the concern of the Society of Medical Officers of Health, the Association of Medical Superintendents, and the Association of Municipal Specialists, acting through the British Medical Association. The impending separation of medical officers of health from hospital activities makes opportune the formation of a directly representative association to promote the interests of full-time hospital medical officers and to be available within the region for consultation in all aspects of hospital practice.

The association is called the Association of Hospital Medical Officers (Welsh Region), and membership is open to medical superintendents, consultants and specialists, and medical officers of registrar grade and above. Associate membership is open to junior medical officers of hospitals. It is hoped that other regions will form similar associations, and that these will ultimately amalgamate to form a national body having a recognised status within the British Medical Association. The secretary will be pleased to hear from regions where similar activities are contemplated or are actually in being.

East Glamorgan County Hospital,  
Church Village, Pontypridd.

P. T. BRAY  
Secretary.

### ATTACK ON RHEUMATISM

SIR,—Your leading article of March 27 and the subsequent correspondence has concentrated attention on a neglected subject.

A very important aspect, stressed in your article, is that the rheumatic patient does badly in a general medical or surgical ward, whilst his progress in special wards is comparatively encouraging. This is no reflection on anyone, for the care in hospital of an arthritic patient is entirely different from that required by the average general patient. The aim of treatment in the first case is to render the patient mobile and active, whereas in the second case rest is often the keynote. This does not apply to all rheumatic patients at all stages—rheumatoid arthritis in particular may be a very acute disease—but it does apply to all at some stage. Naturally, the converse is also true: general patients usually make poor progress in an arthritic ward.

All are agreed that physicians in charge of units must have the same type of training as any other specialist physicians, in that they must carry the usual higher qualifications; but they must also have a wide knowledge and experience of general medicine. It is probably unwise to put a man in charge of such a unit until he is at least 35 years of age, and until that age he should make a special point of keeping up all his contacts with, and interest in, general medicine. Furthermore, a close relationship must be maintained with the other members of the hospital staff, and the fullest use made of the expert advice which the general physicians and surgeons willingly give in their respective fields. It has, moreover, been found to be a great help if distinguished clinicians of the day give demonstrations on the general medical aspect of selected cases.

Just as a thoracic unit must have a thoracic surgeon attached to it, so must a rheumatic unit have an orthopaedic surgeon attached. The surgeon should be called in early, and the arrangement at the Royal Free Hospital is probably the best, whereby the orthopaedic surgeon goes round the wards at regular intervals and sees all the cases referred to him. The relationship with the physical-medicine department has presented few difficulties so far. Advice from the department is always being sought, especially in difficult cases where the best treatment is in doubt. Research into methods of physical treatment is very badly needed, but this is difficult to plan and tends to fall between the fields of the pure physicist, the medical physicist, and the physiologist.

Perhaps for the same reason, criteria of improvement with physical methods are difficult to establish.

Haphazard investigation into the aetiology of locomotor disorders wastes time and energy; some recent papers on the treatment of rheumatoid arthritis add point to this view. Before any extensive piece of research is begun, a pilot experiment should be conducted to discover the likely pitfalls, and the highest authorities should be consulted to determine the best way to approach the problem in hand.

With regard to teaching: undergraduates should not be overwhelmed with a mass of technical specialist detail, which unbalances the curriculum and does not make them think for themselves. If the broad outline of the locomotor system is described with special reference to disease, students will be able to deduce their own details. Postgraduate instruction differs entirely from this and is especially aimed at showing the possible lines of advance; it follows that a great deal of detail must be included.

Rheumatic units are on trial, and it is essential that they should reach the same high standard as do the other departments of teaching hospitals. The study of the medical locomotor disorders seems to me a satisfying branch of general medicine, and it is encouraging that young men with distinguished records are now coming forward to make it their career.

London, W.1.

ERNEST FLETCHER.

SIR.—Correspondents have stressed the necessity of being a general physician before concentrating on the diagnosis and treatment of the rheumatic diseases. However, if the attack on rheumatism is to be more than a mere harassing operation by scattered physicians, it must be planned on military lines. In 1939 there existed two conceptions of the rôle of the tank in warfare. One school argued that these special weapons should be evenly distributed up and down the front among the various infantry divisions, the other (that of de Gaulle) that they should be grouped into special units which would thus carry a heavy punch. We know now which conception was the correct one. The establishment of special rheumatic units by the Swedes has shown that in the realm of medicine, as in that of military tactics, it is the weight of the attack (by the concentration of specialists with a common purpose) which really matters.

London, W.1.

DAVID PREISKEL.

#### A POSTMAN'S OPINION

SIR.—It may interest you to know that our local postman, who delivers THE LANCET when it eventually gets here and whose daughter with a huge extrinsic carcinoma of larynx is spending her last days in our hospital with tracheotomy and gastrostomy tubes in place, has thrice (out of his very meagre government pay) made subscriptions to a rebuilding fund for the hospital on the score that the British people are still willing to send their books and medical periodicals to help the medical work in China.

Methodist Hospital, Fatshan via Canton,  
South China.

J. R. ROSE.

#### THE DOCTOR'S WIFE

SIR.—I should like to support, from my limited but happy experience of panel practice, the views expressed by "Practitioner" in your issue of April 17. To be able to institute treatment and to visit the patient's home without thinking about money, is of the very essence of professional freedom. As to certification, surely that is not too heavy a burden to bear? It does not require much physical or mental effort to fill in one, two, or even three certificates. I think the moaners and groaners are overdoing their pose of martyrdom here. After all, the average doctor does not object to entering a note on the patient's condition in his records, nor to writing out a prescription.

I have never felt that my resources and time are unduly exploited by panel patients. The average man will give a square deal, if he himself gets one. Moreover, what is trivial to the observer may be important to the sufferer, and we cannot ignore his mental state. As "Practitioner" points out, only re-education can restore

the patient's faith in himself and make him independent of the "bottle."

In conclusion, Sir, I should like to express my thanks to "Practitioner" for his humane and sensitive letter. It is satisfactory to feel that there are among us some who have a positive attitude to life and work, and faith in their fellow men.

ENCOURAGED.

#### PENICILLIN AND SULPHONAMIDE IN TYPHOID FEVER

SIR.—In 1946 I described in your columns the results obtained in the treatment of 5 cases of typhoid fever with large doses of penicillin and sulphathiazole.<sup>1</sup> I stated that two courses, each of 10 mega units of penicillin with 34 g. sulphathiazole given during 4 days, with an interval of 2-3 days between the courses, had caused speedy subsidence of toxæmia and pyrexia and disappearance of organisms from blood, fæces, and urine. I added that the system of dosage was arbitrary and might require modification with further experience.

In your issues of April 3 and 10 appear two articles which purport to give the results of clinical trials of this new approach to typhoid therapy. The first is a commentary by Brigadier Parsons on the opinions conveyed to him by about a dozen military specialists from Egypt, Palestine, and Iraq concerning small groups of cases treated by them. Parsons makes it clear that the methods of administration suggested by me were "closely followed only on rare occasions." In the reports of his colleagues I cannot find one single record of a patient who received two courses of 10 mega units of penicillin and 34 g. sulphathiazole separated by an interval of 2-3 days; this interval is necessary to permit "persisters" to grow out after the first course. Some cases got an extended course (8 days) without intermission, and others got fantastic doses of penicillin for brief periods—e.g., 24 mega units in 24 hours. The majority of the Egyptian cases were given a dose of penicillin less than one-third of that necessary to produce the concentration of penicillin in the blood suggested by the work of Bigger<sup>2</sup> as requisite to destroy *Salmonella typhi*; and this inadequate dosage was given in a single course. In fairness to Parsons it must be said that he did not see the cases himself, and that he does not consider it feasible to analyse statistically these Middle East reports. He is quite right in assuming that typhoid fever does not react to chemotherapy in the dramatic way pneumonia and meningococcal meningitis do. The adjective "synergistic" is a more apt word than "specific" to apply to the combined action of penicillin and sulphathiazole on *S. typhi*; and the best that can be expected is a steady downward trend in the temperature and relief of toxæmia spread over a week or 10 days. Rarely, a case may react more rapidly.

Very different to the non-committal and guarded summing-up of Parsons are the conclusions of the Welsh investigators published in your issue of April 10. An outbreak of typhoid occurred in Aberystwyth in July, 1946, involving some 200 cases; this offered a good opportunity of evaluating the results of the new synergistic therapy just then published. No less than 97 cases were reported from Aberystwyth, 30 from adjoining rural districts, and 75 from various other parts of the county. "It was decided to follow as closely as possible the procedure McSweeney had adopted." Let us see how this intention was carried out.

At the Fever Hospital, Aberystwyth, where 57 cases were treated, we get particulars of 25. Of these, 10 patients received one course only of penicillin and sulphathiazole, 4 receiving less than 10 mega units and 1—said to be very severely ill—little more than 2 mega units; none died. Another 11 cases received two courses, but in 7 of these the first course was less than 7 mega units and in 7 the interval between the two courses (which should have been 2-3 days) varied from 6 to 40 days. Yet 8 of them are said to have improved after one or other course (table 1). These 11 cases were graded: very severe (5), severe (2), and moderately severe (4). None died. It would appear that 2 were not given their second course until a relapse had actually occurred.

1. *Lancet*, 1946, ii, 114.

2. Bigger, J. W. *Ibid.*, 1946, i, 81.

The writers go on to say that 8 of the 25 tabulated cases were selected for trial of the penicillin-sulphathiazole treatment, and the results obtained in these 8 cases were compared "more accurately" with those obtained in 8 similar cases not given any drug treatment. All these patients were in the third or fourth week of the disease; no details whatever are given of the control cases. It is stated that no deaths occurred in the cases given penicillin and sulphathiazole. Were the 2 deaths in the Aberystwyth cases among the control group?

The most interesting feature of this report emerges from a study of table 1, where it is shown that of the 8 cases specially selected for the purpose of "more accurate trial" of the treatment suggested by me, 5 received only one course. Among the 3 who received a second course the interval between the courses was no less than 9, 13, and 17 days respectively. So that in this, the "hard core" of the Aberystwyth investigation, which was designed to follow as closely as possible the system of dosage described in 1946 not one single case was treated in the way suggested. In these circumstances the findings relating to the rate of disappearance of organisms from blood, faeces, and urine must be discounted. It will be sufficient to draw attention to one or two more anomalies in this investigation.

Of the 25 cases of typhoid concerning which we get details only 4 showed positive blood-cultures before treatment; in no less than 20 no blood-culture was carried out, and—in post-war Britain where a large proportion of the population must have been inoculated with T.A.B.—confirmation of clinical diagnosis appears to have rested on the equivocal results of agglutination reactions or possibly even of faecal and urinary examinations.

It is further stated that 4 patients yielded a positive blood-culture "after the completion of a full course of penicillin-sulphathiazole"; but table 1 shows that these positive blood-cultures were obtained after a single course consisting respectively of 7.2, 7.2, and 10 mega units in 3 cases and after a total dosage of 17.2 mega units in the 4th, all 4 having thus received an inadequate dosage. Again in the text it is said that 2 "treated" cases—nos. 19 and 24—remained persistent excretors, but in the table case 24 is shown as receiving no penicillin or sulphathiazole but 100 ml. of anti-typhoid serum.

As to the place of the anti-typhoid serum of Felix in the treatment of typhoid, I may perhaps be allowed to say a word. We were the first to use this serum in these islands nearly 14 years ago, and since then hundreds of cases have received it in the wards of Cork Street Hospital. I have described the beneficial effects produced on toxæmia especially in hypertoxic cases of typhoid given the serum early in the disease.<sup>3</sup> Unlike Dr. Bevan and Dr. Sudds, who gave it to 5 cases, I have never seen it do any good when given as late as the fourth and fifth week of the illness.

In Carmarthen Isolation Hospital there were 12 cases in the "treated" group and 10 in the control. It is admitted by Dr. Evans and Dr. Parker that the "treated" cases were more severely ill than the control. The 12 patients received between them 17 courses of treatment; those who received a further course got it "6-10 days after the first." Two additional courses were given during relapses. The results are fairly described as inconclusive, but it must be pointed out that not a single case in this series received the system of dosage recommended by me.

In Swansea a small series of 14 cases was treated, of which 6 were given the treatment suggested by me. These are the only cases among the 202 cases infected in Aberystwyth who appear to have been given adequate synergistic treatment. All 6 recovered, and it seems likely that at least 1 of them would have died had not the second course been given after the right interval.

With what Dr. Pugh and Dr. Sladden say about stepping up dosage in very severe cases I heartily agree. Our procedure with severe cases during the last two years has been to extend the first course to 12 mega units, and after the 2-day intermission to give a similar dose in the second course, with the usual dose of sulphonamide during each. Thirty mega units of peni-

cillin may be required in some exceptionally severe cases to eliminate organisms from the blood, faeces, and urine. Since my article was published in 1946 we have treated 28 severe cases and in all of them the blood, faeces, and urine have remained free of organisms after the conclusion of the second course.

One final point: the success of the synergistic treatment of typhoid implies a satisfactory standard of nursing and calls for a fluid intake of not less than 6 pints a day. Most of our patients drink 8-10 pints of fluid a day, and this may be the reason why they have not been troubled with vomiting or other toxic manifestations of sulphonamide therapy. I readily admit that favourable results in the treatment of severe typhoid are more easily obtained in a city hospital with a nursing staff long experienced in handling typhoid than in the emergency conditions prevailing in military or rural hospital practice.

It would be unfortunate if a new and promising line of approach to the treatment of typhoid should be discarded on evidence which, in my view, is at the very least inadequate.

House of Recovery and Fever  
Hospital, Cork Street, Dublin.

CHRIS J. MCSWEENEY  
Medical Superintendent.

SIR,—I read with great interest Brigadier Parsons's excellent article in your issue of April 3.

Since 1940 I have used extensively in the treatment of typhoid fever first the sulphonamides alone, then sulphathiazole with penicillin and blood-transfusions. A severe epidemic of typhoid (always endemic here) gave me the opportunity to follow several hundred cases. I am firmly convinced that we have here therapeutic agents which, although not specific, if used correctly improve the prospects in severe typhoid fever. The contradictory results obtained by different observers can be explained by the fact that these agents have not always been employed at the right time and in a rational manner. My criteria in the treatment of typhoid fever with sulphathiazole, penicillin, and blood-transfusions, and the hypothesis of pathogenesis which prompted me to adopt them, were reported at the Académie de Médecine de Paris on Nov. 5, 1947,<sup>1</sup> and in greater detail at the Société Médicale des Hôpitaux de Paris on Jan. 16 this year.<sup>2</sup>

As Brigadier Parsons rightly points out, "an undoubted reduction in mortality would be significant." The mortality of typhoid fever in my service was reduced last year to about 3%.

Hôpital de la Libération, Tunis.

RAOUL DANA.

## Parliament

### QUESTION TIME

#### - World Health Organisation

MR. FRANCIS NOEL-BAKER asked the Minister of Health what action he had taken to associate the medical profession in the United Kingdom with the work of the World Health Organisation; and to bring to the notice of the general public its achievements in campaigns against venereal disease, tuberculosis, malaria, and pestilential diseases.—MR. ANEURIN BEVAN replied: The organisation's first meeting has not yet been held. But I associate myself with the general objects to which my hon. friend refers, and shall not overlook them.

MR. NOEL-BAKER: Has H.M. Government issued any invitation to WHO to hold the World Health Assembly in London in 1949?—MR. BEVAN: The first meeting of WHO, which I had hoped might be held in London, has now been arranged for Geneva in June. I shall consider whether at that meeting it would be possible to offer accommodation in London for the 1949 assembly.

#### Panel Doctors' Fees

SIR ERNEST GRAHAM-LITTLE asked the Minister if panel doctors under their present contract would be paid for any new patients taken on their lists for treatment during the quarter previous to the expiry of the National Health Insurance Act.—MR. BEVAN replied: It is contemplated that the payments an insurance doctor will receive for the period

3. *Ibid.*, 1935, 1, 1095; *Brit. med. J.* 1937, II, 1118.

1. *Bull. Acad. Méd. Paris*, 1947, p. 619.

2. *Bull. Soc. méd. Hôp. Paris*, 1948, 64, 30.

Jan. 1 to July 4, 1948, will be based on the average of the number of persons on his list on Jan. 1 and April 1.

### Employers and Benefit Payments

Mr. HENRY BERRY asked the Minister of National Insurance whether he would give an assurance that when the new National Insurance scheme comes into operation on July 5, 1948, he would be prepared to make available to employers who made up their employees' statutory sickness benefit to full pay or a proportion of full pay, information as to the amount of statutory sickness benefit received by any such employees to enable their schemes to be properly and fairly administered.—Mr. TOM STEELE replied: It would be contrary to practice to give information to third parties about benefit payments. I am, however, advised that employers should have no difficulty in getting direct from their employees any information they require for their own sick-pay arrangements.

### Hardship Allowances

In reply to questions, Mr. GEORGE BUCHANAN, Minister of Pensions, announced that the special hardship allowance for war pensioners of 11s. 3d. a week would be increased to a maximum of 20s. a week and made applicable to the 1914 war cases in addition to those of the 1939 war.

### Pension Claims

Dr. HADEN GUEST asked the Minister what was the number of claims made for pension and allowed for pension, respectively, by members of H.M. Forces in 1947, showing the number made on account of disease and injury separately.—Mr. BUCHANAN replied: Approximately 61,300 claims in respect of disease and 19,100 in respect of injury were settled in 1947. The numbers allowed were about 49,500 and 18,000 respectively.

Dr. HADEN GUEST asked the Minister what was the number of claims made for pension in respect of diabetes, cancer, and leukaemia during 1947.—Mr. BUCHANAN replied: There were 303 claims in respect of cancer and 299 for diabetes. Leukaemia is included with other blood diseases in a group for which the total number of claims was 88.

### Hospitals in Scotland

Mr. W. GALLACHER asked the Secretary of State for Scotland how many new hospitals were completed in Scotland in 1947; and the number now under construction.—Mr. ARTHUR WOODBURN replied: The limited building resources available for hospital work have been used up till now to improve and extend existing hospitals. No new hospital is now under construction.

### Diet in Naval Hospitals

Commander J. F. W. MATTLAND asked the Parliamentary Secretary to the Admiralty what steps he was taking to improve the cooking facilities in the Royal Naval hospitals at Portsmouth, Chatham, and Devonport.—Mr. W. J. EDWARDS replied: Additional cooking equipment is being provided at Chatham and Portsmouth, and the position at Plymouth is under consideration. Arrangements for distributing food to the wards in all three hospitals are being improved by the provision of electrically heated food conveyors.—Commander MATTLAND: Are trained dietitians included in the staffs of the hospitals.—Mr. EDWARDS: No.

### Imports of Scientific Books

Mr. S. T. SWINGLER asked the President of the Board of Trade if he could make a further statement about imports of learned, scientific, and technical books.—Mr. HAROLD WILSON replied: I have been going into this question, as I have always been aware of the strength of the case for increasing imports of the classes of books mentioned, although I have had to balance this against our exchange position. I am glad that I am now able to tell the House that learned, scientific, and technical books may, as from April 1, be imported at twice the present rate, thus raising the annual import quota to 200% by value of the pre-war level.

### Manor House Hospital and Clinic, Hampstead

Mr. L. D. GAMMANS asked the Minister of Health for what reason this hospital and clinic were to be exempted from the National Health Service.—Mr. BEVAN replied: It appeared to me that their transfer was not required for the purpose of providing hospital and specialist services under the Act.

DURING the three weeks' tour of Yugoslavia which he is making for the British Council Sir Harold Gillies will lecture in Belgrade and in provincial centres on plastic surgery.

## Public Health

### The Nation's Health

At a press conference at the Ministry of Health last week Sir Wilson Jameson, the chief medical officer, said that the first three months of 1948 were easily the best on record; the death-rate of 12.3 per 1000 population could be compared with the rate of over 17 in the same quarter last year or with that of 13.2 in the first quarter of 1943—hitherto the first quarter with the lowest rate. This year there had been only 644 deaths from influenza and some 11,000 notifications of pneumonia in the first three months, compared with 2796 and over 15,000 last year.

**Diphtheria.**—The provisional totals for 1947 were 10,469 cases and 244 deaths. "We are on the verge of wiping out diphtheria as an epidemic disease." A new danger was that the decreasing incidence might lull parents into a false sense of security; and the number of infants who were being immunised before their first birthday was in fact below the 75% which was aimed at.

**Tuberculosis.**—The number of deaths from all forms of tuberculosis last year was 23,572, compared with 22,847 in 1946. B.C.G. vaccine was being obtained from Denmark.

**Poliomyelitis.**—Dr. W. H. Bradley, a senior medical officer, gave the figures for cases, deaths, and residual disabilities from last year's outbreak.<sup>1</sup> The general rise in poliomyelitis during the past twenty years had been most evident, he said, in the United States, but it had also affected Europe, particularly since 1935, and last year there were nearly 20,000 cases in seven representative European countries. Areas where the incidence was high one year usually had a low incidence the next year, but neighbouring areas then often had a high incidence. The 1947 epidemic in Britain having been widespread, there was hope that the country might escape a further epidemic this summer. A new film for medical audiences, in which special emphasis was laid on early diagnosis, was being prepared and would be released in June. In July the First International Conference on Poliomyelitis was to be held in New York.

**Veneral Diseases.**—Dr. G. L. M. McElligott, the Ministry's adviser in venereal diseases, expressed the view that the 1947 returns augured fairly well for the future. There were two hopeful signs: one was that the proportion of females with syphilis who were examined and treated at clinics was growing; and the other was that, despite the rise during 1946 in the number of new recorded cases of syphilis (which was due to demobilisation), there was no corresponding increase during 1947 in congenital infection. In 1938 the number of new cases of syphilis was 5238; in 1946 it was 17,875; last year it was 15,166. "For an educated and fully employed people the incidence is far too high."

### BIRTHS IN THE FIRST QUARTER

The Registrar-General announces<sup>2</sup> that the number of live births registered in England and Wales during the quarter ended March 31 was 202,184, compared with 193,865 for the December quarter, 1947, and 241,421 for the March quarter, 1947. The corresponding rates were 18.8, 17.8, and 22.6 per 1000 total population respectively. Stillbirths registered during the quarter numbered 5043, giving a rate of 24.3 per 1000 total live births and stillbirths. This is the lowest for any March quarter.

### Travellers' Immunisation Certificates

There have been reports of refusal in some parts of the world to accept travellers' immunisation certificates unless these are endorsed by a medical officer in the government or municipal service of the country of issue. The Minister of Health has therefore suggested (circular 60/48) that, where the traveller so wishes, local public-health authorities should be prepared to stamp individual doctor's certificates; the stamp, it is proposed, might bear the words "signature of doctor authenticated" and the name of the local authority.

1. See *Lancet*, April 3, p. 541.

2. Registrar-General's Weekly Return of Births, Deaths, and Infectious Diseases for the week ended April 17. H.M. Stationery Office. 6d.

## Obituary

### ERIC GUTTMANN

M.D. MUNICH, M.R.C.P.

Dr. Eric Guttman, who died in the Hammersmith Hospital on April 25, combined to an exceptional degree the best qualities of the clinician and the research-worker. His solid training in neurology gave weight and exactitude to his later investigations which were often psychological and social, and his fresh, incisive, luminous intellect enabled him to seize the essentials of every problem that came his way. The diversity of these problems attests the range of his perception, and the links which he forged between them show how fruitfully his comprehensive mind could bring hitherto disparate aspects of psychiatry and neurology into relation with each other.

Born at Gleiwitz in Upper Silesia in 1896, Guttman received a sound classical education, often revealed in his graceful, witty, allusive conversation. He studied medicine in Munich, and after qualifying worked under Cassirer in the lively neurological clinic which Oppenheim had set up on the doorstep of the Charité in Berlin. Then he returned to Munich to occupy a clinical post in Kraepelin's clinic, where he carried out the series of investigations on neurological aspects of psychiatry which established his reputation. At Munich he worked not only with Kraepelin, but with Spielmeier in the department of morbid anatomy, and with Johannes Lange, whom he later accompanied as reader to the university clinic at Breslau. His contributions during this time to the study of the frontal syndrome and to the elucidation of psychogenic features of organic disease anticipated the work later carried out in the United States and in this country on psychosomatic problems and the effects of surgical intervention in the frontal lobes. He also reported some valuable findings in Schilder's disease, and threw light on the "status dysraphicus."

After Hitler's advent Guttman left Germany, and through the good offices of the Rockefeller Foundation he was able to take up a research post at the Maudsley Hospital in London. Apart from the two fruitful years he spent in Oxford, all his subsequent activity was centred on the Maudsley, which benefited greatly from the loyalty with which he devoted himself and his gifts to it. At first he was wholly engaged in research, and he could, had he wished, have pursued an isolated course, which the many difficulties besetting a foreign newcomer would have amply justified. But he adapted himself rapidly to the new conditions, acquired a real mastery of terse, clear, idiomatic English, and took an increasing share not only in joint investigations stimulated by him but also in teaching and, after a few years, in moulding the policy and development of the medical school.

When on the outbreak of war the Maudsley staff set up the two neurosis centres at Mill Hill and Sutton, Guttman went to Mill Hill, and his sound judgment and grasp of administrative procedure were helpful in establishing the centre and organising its clinical work. The emergency measures instituted by the Government after Dunkirk put a stop for the time being to his activity at Mill Hill: but after a brief interval he found a congenial haven and opportunity for useful work at Oxford, where Professor Cairns afforded him research facilities at the Radcliffe Infirmary. The problems of head injury gave his special experience and talents full scope; and in an important series of papers he published careful observations made by a judicious application of relevant psychological and clinical methods. His value and character were soon fully appreciated in Oxford. He was attached in an honorary capacity to the Military Hospital for Head Injuries, and it was with regret that his Oxford colleagues learnt in 1943 that he was to return to Mill Hill to resume his clinical post there.

With his customary thoroughness and good will Guttman entered upon the manifold tasks that now fell upon his shoulders; and he undertook with special enjoyment the extra duties of honorary psychiatrist to the officers selection centre set up at Hendon for the National Fire Service. In this work, of which the public knew nothing, he was outstandingly successful, and his ability to establish friendly relations with people

was constantly in evidence there. He also found time to conduct for the Ministry of Health a survey of the after-history in civil life of soldiers discharged from the Army because of neurosis.

After the Maudsley returned, at the end of 1945, to its peace-time home and work, Guttman was a tower of strength during the difficult period of resettlement. He took on heavy clinical and teaching duties to tide over the phase when there were many post-graduate students and few seniors to teach them, many new developments and few people to organise and direct them. He never complained of his health or his responsibilities, and it was not until he had a severe cardiac breakdown after an infection last December that his friends learnt that he had a long-standing lesion which had for over a year been giving rise to ominous symptoms. His courage and equanimity were strong, in the face of these blows, and although he was unable to undertake any physical exertion he continued during the last four months of his life to give his colleagues the help of his advice, upon which they had learnt to rely.

The list of topics on which Guttman's investigations cast light is too long to catalogue. His study of the effects and therapeutic use of amphetamine was among the earliest to deal with the clinical applications of this drug. He studied the phenomena of mescaline intoxication, the nature and methods of objective examination of dementia, the psychopathology of art, and many problems of organic neurology. But it was in his effect upon his colleagues, junior and senior alike, that his remarkable qualities most plainly appeared. One of them says: "The number of papers Guttman wrote in collaboration—and a number of others in which his name does not appear—bespeak the generosity with which he stimulated and helped others. His ability to penetrate to the centre of a problem, his clinical acumen and wide experience, and his unrivalled grasp of appropriate methods and relevant literature made him a teacher of exceptional quality. His modesty and utter integrity, the attractive charm of his disposition, and his easy unassuming manners made him lasting friends wherever he went."

Guttman had taken a British qualification in 1939, and in 1943 he obtained the M.R.C.P. He became naturalised at the end of the war. A recognised teacher in the University of London at the Maudsley Hospital, he was also a lecturer at the London School of Economics and consultant to St. Francis's Hospital, and last year he was appointed psychiatrist to the Maida Vale Hospital for Nervous Diseases. He is survived by his wife, Dr. Elizabeth Rosenberg, who is also a psychiatrist, and by a daughter and two sons.

### WILLIAM FRANCIS CHRISTIE

M.D. EDIN.

Dr. W. F. Christie, who died on April 25, was the son of the late Dr. Dugald Christie, C.M.G. He came from a large family, of whom a number entered the medical profession, including Prof. R. V. Christie, of St. Bartholomew's Hospital, and Dr. J. M. Christie, of Finchley.

Coming from Edinburgh, where he graduated M.B. in 1909, with an outstanding athletic record and a not undistinguished academic career, Christie entered the R.A.M.C. as a regular officer. He served with distinction during the 1914-18 war, and later in India. On retirement in 1923 he went into practice in Lancaster Gate, London, where he remained until recalled to serve as a medical specialist during the 1939-45 war. At the end of the war he did not return to practice, but retired to a beautiful old rectory near Peterborough.

At one phase of his career Christie became interested in obesity, and he was the author of two popular books on this subject. These were a happy combination of scientific fact and cynical humour, presented in a language which could be understood by the laity, and illustrated by a famous artist with drawings which emphasised how much the lusts of the flesh contributed to a pathological state.

A first-class tennis-player, Willie Christie was a regular tournament competitor until the last war. A natural host and a charming companion, he had a large circle of friends, both inside and outside the profession.

In his practice he combined kindness and tact with shrewdness and ability, and these characteristics were invaluable to him in dealing with his many important patients, to whom he often had to give unwelcome advice.

Christie is survived by his widow, Cecil, daughter of the late Sir Abe Bailey, whom he met when she was nursing during the 1914-18 war. There were no children.

L. E. H. W.

### JAMES WILLIAM LANGSTAFF

D.S.O., L.R.C.P.I.

Colonel J. W. Langstaff, who retired from his post as superintendent of the Royal Victoria Hospital, Belfast, in 1945, died on April 12.

He was born in 1876 at Athlone, where his father, Dr. H. H. Langstaff, was in practice. After qualifying in 1898 he joined the R.A.M.C. the following year and took part in the relief of Ladysmith. Till 1902 he was in South Africa, and for his services there he received the Queen's medal with five clasps and the King's medal with two clasps. Immediately war broke out in 1914 he was posted to France, where he served till the beginning of 1917, winning the D.S.O. and being three times mentioned in despatches. In 1929 he retired from the R.A.M.C. with the rank of colonel, and two years later he was appointed superintendent of the Royal Victoria Hospital. While he held office there a good deal of building and rebuilding was accomplished, and one of his colleagues has written: "Langstaff showed himself a wise and careful planner, letting his judgment follow careful thought. He had the quiet voice that restored confidence, the gifts of tact, of seeing the other person's point of view, of creating discipline without using the words, and a smile which we all missed when he left us."

## Diary of the Week

MAY 2 TO 8

### Monday, 3rd

ROYAL COLLEGE OF PHYSICIANS, Pall Mall East, S.W.1  
5 P.M. Sir Leonard Parsons, F.R.S.: Antenatal Pædiatrics.  
INSTITUTE OF LARYNGOLOGY AND OTOTOLOGY, 330, Gray's Inn Road, W.C.1  
2.30 P.M. Miss D. J. Collier: Facial Paralysis.  
WESTMINSTER HOSPITAL, Horseferry Road, S.W.1  
5.30 P.M. (Meyerstein lecture theatre.) Clinicopathological demonstration on emphysema.

### Tuesday, 4th

ROYAL COLLEGE OF PHYSICIANS  
5 P.M. Dr. J. G. Soadding: Classification of the Pneumonias.  
INSTITUTE OF DERMATOLOGY, 5, Lisle Street, W.C.2  
5 P.M. Dr. I. Muende: Dermatophytes.  
EDINBURGH POST-GRADUATE BOARD FOR MEDICINE  
5 P.M. (Royal Infirmary.) Prof. Kerpel-Fronius (Pecz): Salt and Water Parallelism.

### Wednesday, 5th

UNIVERSITY OF DURHAM  
5 P.M. (Royal Victoria Infirmary, Newcastle-on-Tyne.) Sir Heneage Ogilvie: A Surgeon's Life. (Rutherford Morison lecture.)  
UNIVERSITY OF GLASGOW  
8 P.M. (Department of Ophthalmology.) Dr. I. C. Michaelson: Growth of Ocular Vessels.  
MEDICO-CHIRURGICAL SOCIETY OF EDINBURGH  
8.30 P.M. (7, Drumshough Gardens.) Mr. Andrew Logan: Carcinoma of the Lung.

### Thursday, 6th

ROYAL COLLEGE OF PHYSICIANS  
5 P.M. Dr. J. H. Sheldon: Old Age.  
INSTITUTE OF DERMATOLOGY  
5 P.M. Dr. Brian Russell: Seborrhæic Eruptions.  
INSTITUTE OF LARYNGOLOGY AND OTOTOLOGY  
3 P.M. Dr. Jean Leroux-Robert (Paris): Modification of Laryngotomy.  
5.30 P.M. Mr. J. Angell James: Diseases of the Antrum of Dental Origin.  
LONDON JEWISH HOSPITAL MEDICAL SOCIETY, Stepney Green, E.1  
3 P.M. Dr. Bronowski: Medical Statistics.  
ROYAL PHOTOGRAPHIC SOCIETY, 16, Prince's Gate, S.W.7  
7 P.M. Medical group. Mr. F. J. Pittock, F.R.P.S.: Photomicrography.  
HONYMAN GILLESPIE LECTURE  
4.30 P.M. (Edinburgh Royal Infirmary.) Dr. R. B. Hunter: Experimental and Clinical Use of Anti-histamine Drugs.

### Friday, 7th

ROYAL COLLEGE OF PHYSICIANS  
5 P.M. Dr. Sheldon: Disorders of Iron Metabolism.

### Saturday, 8th

INSTITUTE OF LARYNGOLOGY AND OTOTOLOGY  
11 A.M. Dr. Julius Lempert (New York): Modern Temporal Bone Surgery—the Philosophy of Its Evolution.

## Notes and News

### SCOTTISH SOCIETY OF THE HISTORY OF MEDICINE

APART from the section of the Royal Society of Medicine, the new Scottish Society of the History of Medicine, which held its inaugural meeting in Edinburgh on April 13, is the only society of this kind in Britain. It already has a potential membership of about 60. At the opening meeting Dr. H. J. C. Gibson read a paper on the Early Days of the Dundee Royal Infirmary, of which he is medical superintendent. Dr. Gibson traced the history of the hospital from its foundation as a dispensary in 1735 to the building of the new infirmary in 1855, by which time it had become one of the chief voluntary hospitals of Scotland, serving the needs of patients from Angus, East Fife, and Perthshire. Dr. Douglas Guthrie, who is president of the new society, explained that meetings will be held not only in Edinburgh but also in Glasgow, Aberdeen, and Dundee. The hon. secretary is Dr. H. P. Tait, 137, Colinton Road, Edinburgh. At the second meeting, in June, Dr. John Ritchie will speak on Quarantine for Plague in the Sixteenth and Seventeenth Centuries.

### SOCIETY OF CHIROPODISTS

DURING the annual convention of this society in London last week a reception was held at the Savoy Hotel. Mr. John H. Hanby, the president, spoke of the remarkable progress of chiropody in the past 15 years, and welcomed especially Mr. E. G. V. Runting who had done so much to make it possible. He was glad that chiropody was to have a place in the National Health Service, but regretted that this place was still so largely undefined. Some 80% of people today were receiving only palliative treatment, and chiropodists wanted to do preventive work among children. But palliative treatment was badly needed today to keep people on their feet, and the medical student was not fully trained unless he knew what could be done for the minor disabilities encountered in such thousands. Sir Heneage Ogilvie, who proposed The Society, rejoiced that Guy's Hospital had been one of the first to recognise that chiropodists were a necessity for a comprehensive service and had appointed Mr. Hanby as instructor. Every medical school needed a chiropodist to demonstrate his skill; every hospital should have one on its staff; every business should recognise the need for caring for its employees' feet; and a day must come when every school-child's feet were examined. Forty years ago the Royal College of Surgeons had supported the granting of a charter to chiropodists, and he hoped they would soon have a hall of their own. Mr. Charles Challen, M.P., proposing The Medical Profession, said that he regarded chiropodists as part of it. Sir Alfred Webb-Johnson, F.R.C.S., responding, congratulated the society on the status it had acquired in so short a time. Relying on the three E's—education, examination, ethics—it was making giant strides towards the attainment of a corporate status established for all time.

### University of Oxford

Dr. J. M. K. Marsh has been elected to a Radcliffe travelling fellowship.

### University of London

Mr. J. F. Danielli, D.Sc., is delivering a course of six lectures on Pharmacology and Cell Physiology on Thursdays, at 5.15 P.M., in the physiology theatre at University College, Gower Street, W.C.1. The second lecture, on May 6, will be devoted to Surface Phenomena and Drug Action. The remaining dates and subjects are as follows: May 13, Permeability and Drug Action; May 20, Enzymes and Drug Action; May 27, Biological Responses to Drugs; and June 3, Action of Drugs on Mitosis.

### Royal College of Surgeons of England

The following 14 candidates have been nominated to fill 3 vacancies on the council:

Sir Harry Platt, A. C. Palmer, A. C. Perry, Rodney Maingot, R. H. O. B. Robinson, A. Dickson Wright, H. J. McCurrich, A. Hedley Whyte, H. W. Symons, M. F. Nicholls, E. W. Riches, R. C. Brock, Sir Archibald McIndoe, H. W. Rodgers.

Further particulars and the present constitution of the council will be found in our advertisement columns.

The otolaryngology lecture course which was to have been held at the college from April 26 to May 12 has been cancelled.

**Royal College of Physicians of London**

The British Red Cross and the St. John War Organisation, in recognition of the services of the medical profession during the war, have given £20,000 for the development of the college's library. The gift will enable the college to establish research scholarships in the history of medicine.

**Royal Faculty of Physicians and Surgeons of Glasgow**

The following have been admitted to the fellowship:

Harold Baytch, John Clark, Lionel Dalrymple Gardner, Francis John Hebbert, Colin Mackay Kesson, Astor Balfour Sclare (qua physicians); Jaswant Rai Aggarwal, John Alexander Bentham, James Boyd Jack, Phillip Wen-Chee Mao, Robert Morton Mitchell, John Ernest Morton, Richard Davidson Muckart, Frank Henri Schikking (qua surgeons).

**Association of Surgeons of Great Britain and Ireland**

At the annual meeting of the association, which is being held in Edinburgh on May 6, 7, and 8, Mr. C. R. Harington, F.R.S., Dr. H. L. Marriott, Prof. W. C. Wilson, Prof. Ian Aird, and Mr. A. W. Wilkinson will open the first discussion on the Maintenance of Metabolism by Parenteral Methods. Other subjects to be discussed are Diaphragmatic Hernia (openers, Mr. Basil Hume, Mr. C. Price Thomas, and Dr. A. S. Johnstone), Hypertension (Dr. Geoffrey Evans, Prof. G. A. G. Mitchell, Prof. M. Boyd, and Prof. J. R. Learmonth), and Surgery of Pancreatic and Ampullary Neoplasms (Dr. C. V. Harrison, Prof. John Kirk, and Prof. John Morley).

**Hunterian Society**

At a meeting held on April 19 the following officers were elected for the 1948-49 session:

President: Dr. G. R. Mather Cordiner. Vice-presidents: Dr. J. B. Cook, Mr. Alex. Roche, Sir John Weir, Dr. A. Westerman. Members of council: Mr. H. L. Atwater, Dr. R. E. Batson, Dr. Franklin Bicknell, Dr. J. A. Brincker, Dr. S. A. R. Chadwick, Dr. J. H. Dunn, Mr. C. A. Francis, Dr. Jenner Hoskin, Dr. D. C. Norris, Dr. Kenneth Robson, Mr. A. Dickson Wright, Dr. Fred Wrigley. Orator: Sir Heneage Ogilvie. Trustees: Dr. A. P. Gibbons, Mr. A. E. Mortimer Woolf. Treasurers: Dr. Irwin Moore, Dr. W. M. MacNaught. Editor: Mr. Mortimer Woolf. Librarian: Mr. C. R. Rudolf. Secretaries: Mr. J. C. Ainsworth-Davis, Dr. K. McFadyean.

The following were elected to the honorary fellowship:

Lord Horder, Sir Bruce Bruce-Porter, Sir Gordon Gordon-Taylor, Sir Hugh Lett, Sir Henry Tidy, Prof. G. Grey Turner.

**United Nations Food and Agriculture Organisation**

Mr. Norris E. Dodd, United States under-secretary of agriculture, has been appointed director-general of the organisation in succession to Sir John Boyd Orr, M.D., F.R.S.

**Chelsea Clinical Society**

The annual dinner of the society will be held at the South Kensington Hotel, 41, Queen's Gate Terrace, S.W.7, on Tuesday, May 11. Further information may be had from the hon. secretary, Mr. H. P. Baylis, 8, Lower Sloane Street, S.W.1.

**Edinburgh University Club**

The 238th dinner of the club will be held on May 20 at the Savoy Hotel, London, with the Duke of Edinburgh as guest of honour and Sir John Anderson in the chair. Further information may be had from the hon. secretaries, 12, Wimpole Street, W.1.

**Dental Estimates Board**

The Minister of Health has appointed the following dentists as whole-time professional members of the board: Mr. W. L. Boness (chairman), Mr. V. W. Humperson, Mr. T. Leaver, Wing-Commander A. P. McClare, and Mr. F. J. Marson. Of the four part-time members, Mr. W. Kelsey Fry, M.R.C.S., and Mr. Joseph Lauer are also dentists. The board will give prior approval to estimates for certain kinds of treatment (including the provision of dentures) submitted by dentists taking part in the National Health Service. For normal conservative work, and certain other forms of treatment, prior approval will not be needed. The board will also authorise claims for payments submitted by dentists.

**Return to Practice**

The Central Medical War Committee announces that Mr. E. J. Radley-Smith, M.S., F.R.C.S., has resumed civilian practice at 2, Harley Street, London, W.1, and Mr. S. G. Clayton, M.S., F.R.C.S., M.R.C.O.G., at King's College Hospital, S.E.5.

**Liverpool Psychiatric Clinic**

The annual meeting of the clinic will be held at the Town Hall, Liverpool, on Monday, May 3, at 3 P.M., when Prof. H. V. Dicks will speak on New Pathways in Psychiatry.

**St. George's Hospital, London**

Lecture-demonstrations in neurology and psychiatry are to be given alternately by Dr. Desmond Curran and Dr. Anthony Feiling at 4.30 P.M. on Thursdays from May 6 to July 22. The first lecture, on May 6, will be given by Dr. Curran.

An abridged English edition of the universal decimal system for classification of original articles in all fields has been issued, price 25s., by the British Standards Institution, 28, Victoria Street, London, S.W.1.

"PEDIATRICS."—Blackwell Scientific Publications inform us that the yearly subscription of 63s. for the new American journal, *Pediatrics*, which was reviewed in our last issue, is based on the overseas price of \$12. The subscription of \$10 shown on the journal only covers distribution in the United States.

CORRIGENDUM.—*Immunitisation against tuberculosis.* The complications of B.C.G. vaccination among 2571 older children observed by Prof. K. A. Jensen were 10 cases of abscess and 2 of adenitis—a complication-rate of 0.47%, not 0.8% as reported on March 13 (p. 419).

**Appointments**

BAAR, H. S., M.D. Vienna: pathologist, Children's Hospital, Birmingham.  
 GOLDBERG, H. M., M.B. Lond., F.R.C.S.: surgeon, Manchester Victoria Memorial Jewish Hospital.  
 JEFFERISS, DEREK, B.A., B.M. Oxid, M.R.C.O.G.: asst. surgeon, obstetric and gynaecological department, Royal Devon and Exeter Hospital.  
 MACGREGOR, M. E., M.D. Lond., M.R.C.P., D.C.H.: consulting paediatrician, Warwickshire.  
 NAGLEY, M. M., M.D. Leeds, D.P.H.: asst. senior physician for tuberculosis, Grove Park Hospital, Leeds.  
 NIVEN, R. B., M.A., B.M. Oxid, M.R.C.P.: asst. physician, King George Hospital, Ilford.  
 PARKINSON, ROY, M.B. Lond., F.R.C.S.: asst. surgeon, Queen Mary's Hospital, E.15.  
 STEPHEN, J. L., M.A., M.B. Aberd., F.R.C.S.E.: surgeon specialist, Paddington Hospital.  
 STEWART, C. J., M.D. Lond., D.OBST.R.C.O.G.: asst. senior physician for tuberculosis, Colindale Hospital, Hendon.  
 WHITE, A. C., M.D., PH.D. Edin., F.R.S.E.: principal M.O., chemical defence experimental station, Porton, Wilts.  
 ZACHARY, R. B., M.B. Leeds, F.R.C.S.: paediatric surgeon, Children's Hospital, Sheffield.

**Royal Free Hospital, London:**

Obstetric and gynaecological registrars:  
 DAVIES, MARGARET, M.R.C.S., D.R.C.O.G.  
 FREWEN, W. K., M.R.C.S., D.R.C.O.G.

**Births, Marriages, and Deaths****BIRTHS**

BARTLEY.—On April 14, at Dewlish, Wimborne, the wife of Dr. C. H. D. Bartley—a daughter.  
 FAIRMAN.—On April 17, the wife of Dr. H. D. Fairman—twin sons.  
 FRAZER.—On April 22, in Birmingham, the wife of Prof. A. C. Frazer—a son.  
 GRANT.—On April 19, at Shrewsbury, the wife of Dr. Gregor Grant—a son.  
 NELSON.—On April 15, at Salisbury, the wife of Dr. M. P. Nelson—a son.  
 PICKERING.—On April 19, at Wiggington, the wife of Dr. P. L. Pickering—a daughter.  
 TURK.—On April 15, in London, the wife of Dr. K. A. D. Turk—a son.

**MARRIAGES**

FOX—WELPLY.—On April 15, in London, David George Ross Fox, M.B., to Kathleen Hardman Welply.  
 MITCHELL—ARCHIBALD.—On April 17, at Wishaw, William Mitchell, to Gowans Archibald, M.B.  
 TWIGG—COOK.—On March 8, at Fareham, Hants, F. J. D. Twigg, C.B.E., surgeon rear-admiral, R.N. ret'd., to Florence M. Cook.  
 VINE—BENNETT.—On April 13, in London, Laban Edwin Vine, O.B.E., F.R.C.S., to Geraldine Edith Bennett.

**DEATHS**

CUTHBERT.—On April 24, at Hindhead, Surrey, Margaret Jane Muddle Cuthbert, M.A., M.B. St. And.  
 GODDARD.—On April 20, Gerald Hamilton Goddard, D.S.O., M.R.C.S., lieutenant-colonel, R.A.M.C. ret'd.  
 GRAPEL.—On April 20, Francis Gaspar Grapel, M.R.C.S.  
 GUTTMANN.—On April 25, Eric Guttman, M.D. Munich, M.R.C.P., aged 52, husband of Elizabeth Rosenberg, M.R.C.P.  
 MARTIN.—On April 19, at Hove, Mary Edith Martin, L.R.C.P.E., aged 72.



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## IS RHEUMATISM A VIRUS DISEASE?\*

MERVYN GORDON

C.M.G., C.B.E., D.M. Oxf., F.R.S.

CONSULTING BACTERIOLOGIST, ST. BARTHOLOMEW'S HOSPITAL,  
LONDON

There can be little doubt that acute rheumatism or rheumatic fever is a specific disease due to some infective agent still unknown. From a review of the literature between 1939 and 1945 Bruce Perry (1947) concludes that though much has been learnt, the real cause of the disease has still to be determined. Little progress can be made until this agent has been defined.

The evidence regarding it is threefold: (1) the results yielded by current bacteriological methods; (2) the nature of the lesions; and (3) new evidence obtained during an approach to rheumatism as an example of virus infection.

## The Significance of Streptococci

In cases of acute rheumatism examination of the blood, of fluids obtained by puncture, and even of the tissues themselves, by routine bacteriological procedures (films and cultures), has given in my hands, as in those of most people, consistently negative results. The only organisms occasionally grown were streptococci, a group closely investigated in the past by Andrewes, Horder, and myself. We found that by taking into consideration the whole of their characters—morphological, cultural, physiological, and pathogenic—as well as their habitat, these cocci could be differentiated into three main classes: salivarius or viridans; pyogenes or hæmolyticus; and faecalis or enterococcus. Later, by employing as criterion the most trustworthy if difficult of the serological methods, the absorption of agglutinin, this broad classification has been confirmed, and each class found to include a number of different antigenic types, of which the greatest diversity seems to obtain among strains of viridans, and a moderate degree among those of faecalis, whereas in hæmolyticus a remarkable uniformity was found.

Thus, of 131 strains of hæmolyticus isolated from active lesions in hospital cases of all kinds 124 absorbed the type agglutinin and were therefore identical.

Dr. A. B. Stewart (1939), working in the bacteriological department of the University of St. Andrews, has found a similar uniformity among strains of hæmolyticus submitted to the agglutination test, and he discovered further that specimens of all the types differentiated by the late Dr. F. Griffith by agglutination absorbed the type agglutinin in the same way and were accordingly subgroups of type-I pyogenes.

In an investigation of bacterial endocarditis, which is so often preceded by an attack of rheumatic disease, streptococci were isolated from the blood of 19 patients and examined by the absorption test. Of these cocci 16 proved to be strains of viridans, and among them no less than 12 different antigenic types were found. The remaining 3 strains were examples of faecalis, and the antigen of each was different from that of the others. On the other hand, all 19 strains of faecalis isolated from cases of puerperal sepsis were serologically identical. When freshly isolated, most of these puerperal strains of faecalis were strongly hæmolytic, and had not their other characters been investigated they would undoubtedly have been mistaken for pyogenes.

Hence it is improbable that in rheumatism streptococci form more than an associated infection. There has been a move lately to lay stress on the part played by hæmolytic strains in starting or reviving an attack of rheumatism by provoking tonsillitis. Granted this, and the positive serological evidence pointing to the activity of the hæmolytic streptococcus in rheumatism, the fact remains that it is the commonest of all the secondary invaders, whatever the primary disease may be.

\* Based on a lecture given to the rheumatism unit at St. Stephen's Hospital (L.C.C.) on June 2, 1947.

When the cutaneous allergy to this organism was examined by testing all the patients in a medical ward at the same time, some 70% of the rheumatic patients gave a positive result; but so also did 50% of the control non-rheumatic patients.

The frequency of the hæmolytic streptococcus in disease also came to notice in a striking way when the new pathological department was built at St. Bartholomew's Hospital with an efficient cold storage to which bodies were conveyed within a few hours of death. The opportunity was taken of examining bacteriologically the heart's blood in 1000 successive cases, with the result that about half of them gave a positive result; and, whatever may have been the primary disease, the organism most often present was the hæmolytic streptococcus.

Moreover, the fact that sulphonamides and penicillin do not control rheumatism, in contrast with their success where the streptococcus alone is operating, endorses this view.

To test the matter once more, observations were carried out at my request to see if a vaccine of the hæmolytic streptococcus, when united to its own specific antibodies absorbed from immune serum, would be of therapeutic value in acute and subacute rheumatism. Though successful in numerous instances of acute infection by the hæmolytic streptococcus alone, this sensitised vaccine had no definite effect in acute or subacute rheumatism.

When attempting to define the primary infective factor of rheumatism, it seems advisable, therefore, to search for some other organism besides streptococci.

## The Lesions

Rheumatism is perhaps the most vicious of all the diseases of the circulation, and the changes found in the bodies of those who die of its acute form, chiefly children, are constant and specific. Yet the pathogenic agent and its modus operandi have for long been obscure.

The first to recognise that the fibrous tissue is specially involved appears to have been Scudamore (1827), who defined rheumatism thus:

"Pain of a peculiar kind, usually attended with inflammatory action, affecting the white fibrous textures belonging to muscles and joints, such as tendons, aponeuroses, and ligaments; the synovial membranes of the bursæ and tendons; and nerves; occasioned by the influence of variable temperature, or by direct cold, or by moisture."

The great value of this contribution is emphasised by Stockman in his own able and scholarly work published in 1920.

It seems that Scudamore also observed that the fibrous portion of the heart, eye, diaphragm, dura mater, and serous membranes may be affected, but he missed the important part the serous membranes play in the arthritis of acute rheumatism. Scudamore also suspected that the periosteum may be involved. He devoted a special section of his book to rheumatic neuralgia, and described a case where a piece of the ulnar nerve, excised for relief of pain with perfect success, showed a thickening of the neurilemma; and another in which, when opened in a similar manner, the sciatic nerve had beneath its fibrous covering "a kind of gelatinous secretion."

The chief changes resulting from rheumatic infection are seen in the heart, especially in children and young adults, where inflammation of the fibrous tissue in the pericardium, myocardium, and endocardium, including the valves, results in the pancarditis so characteristic of the disease. The fibrous tissue undergoes a degeneration for which in its earlier stages the term "fibrinoid" has been suggested by Neumann and Klinger; but what is not so well realised is that this degeneration may continue until the fibrous tissue gives the typical reactions of amyloid degeneration.

Beattie (1906) described 4 instances of this in pure rheumatism; and an example of the same change came under observation post mortem at St. Bartholomew's in a case of subacute rheumatism in which the morbid anatomist had

recorded the presence of pancarditis with "recent vegetations on the mitral valve." When fresh sections of the kidney revealed a pronounced glassy swelling of the fibrous tissue in the background, tests for amyloid degeneration were applied with strongly positive results, not only in the reticulum of the kidney and round a few of the tubules but also throughout the whole of the heart, including the "recent vegetations on the mitral valve." The fibrous portions of the coats of the blood-vessels in the wall of the small intestine throughout its length gave a similar amyloid reaction, but the rest of the alimentary tract did not. Early amyloid changes were present in the fibrous tissue of both liver and spleen, chiefly round the blood-vessels.

But the most significant of the lesions to be found in the heart in acute rheumatism is the Aschoff node, the distinctive feature of the cardiac fibrositis so characteristic of the disease. Fig. 1 shows three of these nodes in the fibrous tissue supporting the muscles of the left ventricle of a girl of 8, who died of rheumatism.

Aschoff (1939), thirty-five years after their discovery and shortly before his death, insisted on the specificity of these nodes as a manifestation of "specific infective rheumatism," and refuted Klinger's suggestion that the

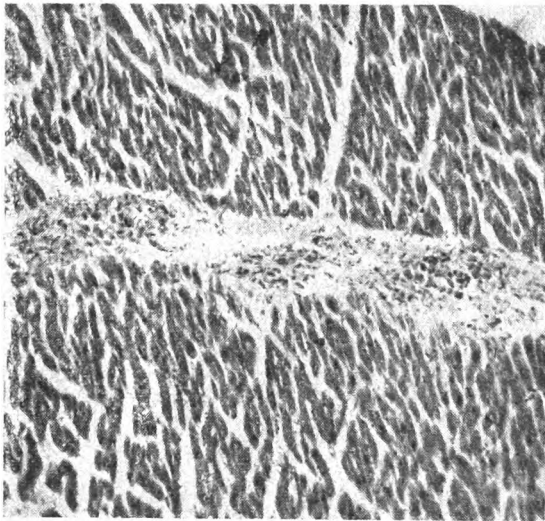


Fig. 1.—Aschoff nodules in wall of left ventricle in acute rheumatism.

node is part of the degeneration of the fibrous tissue. The nodules, Aschoff pointed out, are the prototype of the granulomata that occur in rheumatism in general, and are in fact specific to that condition. They are formed in the connective tissue round vessels of the myocardium; they consist of hypertrophied cells, often multinucleated, and some are even giant cells. Their origin he left open; but he noted that lymphocytes may accompany them.

Most people will agree with Aschoff that the nodes are the hallmark of pure rheumatic infection in man, and Fisher (1937) has shown that they occur also in rheumatoid arthritis. The nearest approach to them that I have seen is in sections from cases of Hodgkin's disease, another granuloma, where giant cells, often multinucleated, are seen in a setting of proliferating reticular and fibrous tissue. The interest of this is that, after long investigation, I have little doubt that Hodgkin's disease is due to a virus.

Elsewhere Aschoff expressed the opinion that the lesions in the human heart produced by streptococci differ from those present in rheumatism. This view will, I think, be widely accepted.

Bacteriological examination of the heart lesions in fatal cases of acute or subacute rheumatism (chiefly in children) has given only negative results. Even when

an intense inflammation was present, with flakes of lymph on the visceral pericardium, no bacteria could be detected in films or cultures. Pieces of the left ventricle excised aseptically and incubated in flasks of broth with various enrichments, and in some instances covered with oil to promote anaerobiosis, gave no growth save an occasional contamination. Even a special search for spirochaetes, maintained for some months with positive controls, failed. The only result of films and dark illumination was to reveal the presence of granules that we now know to be, at any rate in part, elementary bodies. This was in great contrast to the picture when, in sepsis, death had occurred from septicæmia and the hæmolytic streptococcus was present in swarms.

#### Approach to Rheumatism as an Instance of Virus Infection

The existence of pathogenic organisms smaller than those visible under the microscope was hypothesized by Pasteur when studying rabies in 1881. About the same period Robert Koch introduced staining methods and solid media for isolating bacteria in pure culture, thus founding the routine procedure of the bacteriological laboratory that led in the next twenty years to the identification of the causal organisms of some fourteen diseases. Then ensued a pause until in 1892 Iwanowski observed that the infective principle of a plant disease—tobacco mosaic—could pass through a filter that stopped ordinary bacteria. In 1898 Löffler and Frosch followed by showing that the virus of foot-and-mouth disease is filtrable in the same fashion, and in the same year Nocard and Roux found that the organism causing pleuropneumonia in cattle is filtrable and can be grown in culture. Since then most of the infections remaining "wild" have been shown to belong to this group of filtrable viruses—e.g., smallpox, vaccinia, yellow fever, psittacosis, lymphogranuloma inguinale, and influenza. The infective principle of mammalian warts, and of new growths in birds, have also been included in the virus group, and in the eyes of some, including myself, it is only a question of time before mammalian new growths are added to the list.

During a discussion on cancer and viruses reported in the *Proceedings of the Biochemical Society in the Biochemical Journal* (1945) strong experimental evidence in favour of the virus theory was adduced by Prof. W. E. Gye and Prof. James McIntosh, but an experienced clinician who was present stated later that he was even more impressed by a point referred to during the discussion—namely, that the contents of the small intestine of man normally exert a strong viricidal action that ceases after the ileocecal valve. Here possibly is the explanation of the relative immunity of the small intestine to cancer, in contrast to that of the large. The substance concerned in maintaining this viricidal zone of the normal alimentary tract is derived from the pancreatic secretion; it is thermostable, neutralised when mixed with blood *in vitro*, and belongs to the group of the fatty acids (Pirie 1935).

By using filters of known degree of permeability, W. J. Elford and others have shown that there is a very wide range in the size of individual viruses and have constructed a scale of great interest in which each receives its place from the filtering point of view. The criticism has been made that what are actually measured are the smallest elements of each virus that will produce evidence of its presence; and in case of bacteria we know that this may vary a good deal, especially as regards length. Coles (1941) pointed out that the size of viruses when determined by the microscope is larger than the figure, revealed by filtration. Nevertheless Elford's survey is of outstanding importance, and some day it may be possible to correlate size with other physical attributes of a virus.

Notwithstanding their small bulk, each of the viruses is a particulate living organism capable of multiplying rapidly under suitable conditions in the cells, tissues, or



Fig. 2.—Vaccinia elementary bodies from rabbit's testis. ( $\times 4400$ .)

fluids of the living host. Much has been made of the minuteness of these viruses, and interesting information has been contributed by chemists and physicists about them; but its significance so far has been academic rather than pathological. At times too, regardless of Spallanzani and Pasteur, the old bogey of "fluid life" has been revived by some who do not appear to have experienced the discipline of a bacteriological training.

Having investigated viruses experimentally for many years past, I am satisfied that those I have studied are merely smaller and more parasitic forms of the ordinary pathogenic bacteria. To understand them it is essential first and always to bear in mind Harvey's precept that "there is but one road to science, that, to wit, in which we proceed from things more known to things less known, from matters more manifest to matters more obscure." Viruses are best approached in the light of knowledge obtained by the study of bacteria, and the longer the period spent in acquiring it and the more extensive that knowledge is the better. Serological methods, above all, must be mastered first on bacteria. The main problem demanding solution here is not chemical but biological.

#### CHARACTERS OF VIRUSES

In spite of their small size, viruses are particulate living organisms, and when suitably stained most of the more important ones can be seen under the microscope in the form of elementary bodies (E.B.'s) (figs. 2 and 3). Though C. E. van Rooyen has found that the presence of E.B.'s in films can furnish useful information in the diagnosis of smallpox, granules from normal tissues resemble them so closely that for purposes of identification morphology is of even less service than with many of the pathogenic bacteria. This difficulty, however, is one that has occurred before and been overcome. For instance, when in the first world war identification of the meningococcus in cultures from the nasopharyngeal secretion was carried out on a large scale in the Army, the sole use of the microscope was to exclude error; a suspension of the suspect coccus was heated to 65°C, phenolated, diluted to a standard turbidity, and tested for specific flocculation visible to the naked eye after contact with standard sera overnight at 55°C. The results were frequently checked, and found to have a high degree of accuracy.

It is of great importance, therefore, to find that viruses, like bacteria, act as specific antigens; for it means that serology can be applied to their investigation.

The virus that has served as pathfinder for the others is vaccinia, because it is always available, and also "takes" on the shaved and scarified skin of the domestic rabbit of the kind in which there is little or no pigment in the skin (which is easily ascertained by gently blowing on the hair of the back).

Though the E.B.'s of vaccinia were seen by John Buist as long ago as 1887, it is to Paschen that we owe the first proof of their significance by his demonstration that they are agglutinated specifically by immune serum in the hanging drop. But naked-eye agglutination of them occurs too, in much the same manner as in the meningococcus, and is far easier to observe and measure.

Complement-fixation has also proved valuable for identifying viruses, and (being more delicate) is preferred by most to agglutination, though the latter has the merit that in case of doubt from the presence of co-antibodies the absorption test can be applied for checking results.

A third antibody, the neutralising antibody, has proved indispensable in the past in the study of viruses; but its nature—whether, for instance, it is a lysin or not—is not yet clear.

Final proof that the E.B.'s are the actual virus in vaccinia was furnished by Eagles and Ledingham (1932) by showing that they produce the disease when freed of supernatant fluid, and J. Craigie has demonstrated that they will do so after being washed. S. P. Bedson has provided similar proof for his psittacosis organism, and it is only a matter of time for the E.B.'s of other viruses to be admitted to the rank of established causal agents in the same way. This is of great importance in view of the next point to be considered. At present viruses are the growing-point of bacteriology, and the position of knowledge regarding those affecting man is conveniently seen by referring to a book such as that compiled with immense labour by van Rooyen and Rhodes (1940). Unfortunately, it only goes up to 1940. For abstracts of work abroad on viruses the *Bulletin* of the Pasteur Institute is indispensable.

#### SPECIFIC AFFINITY BETWEEN VIRUSES AND THEIR ANTIBODIES

It is fortunate that viruses, like bacteria, obey the fundamental laws of immunity, and combine with their specific antibodies in vitro. In vaccinia Craigie and Tulloch (1931) found that, when good flocculating serum was used and contact allowed for four hours at 37°C, the union was stable:

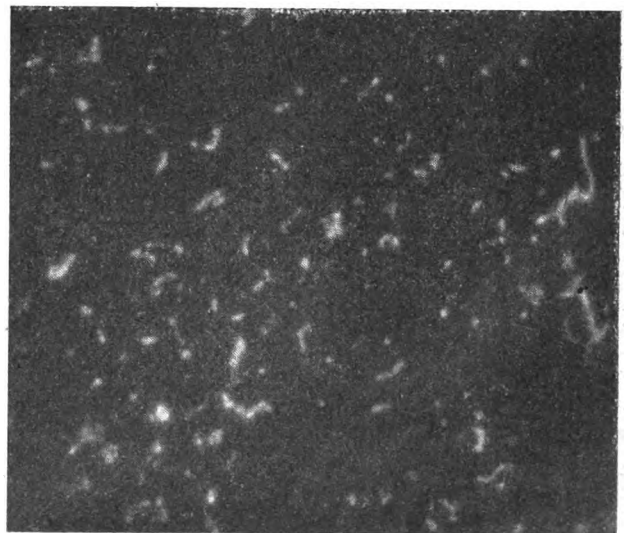


Fig. 3.—Elementary bodies from pericardial fluid in acute rheumatism. ( $\times 4400$ .)

In this delicate work only immune serum of the highest quality succeeds; for weak antibodies, such as may be found in immature sera, are apt to dissociate. Something of this kind seems to have happened occasionally when the combination of toxin and antitoxin *in vitro* was first employed for mass immunisation against diphtheria; but the method was improved, and eventually all danger was eliminated by converting the toxin into toxoid before uniting it with antitoxin.

As with bacteria, so with viruses: flocculation furnishes an excellent index of the degree to which the union between the E.B.'s in suspension and their antibodies is proceeding, and the progress of the "wedding" is easily followed in a centrifuge tube at 37°C by the naked eye assisted by a hand lens.

Only unmistakable flocculation should be accepted: the E.B.'s agglutinate into tiny masses that form in fine showers and settle on the sides and lower parts of the tube, where they may adhere, resembling particles of finely ground pepper. When union is complete, the supernatant fluid is perfectly clear, and the combination of E.B.'s and their antibodies settled at the foot. The tube is then centrifuged at 3000 r.p.m. for 30 min., after which the tube is inverted to get rid of the fluid, and the deposit is carefully taken up in saline containing 0.5% of phenol which takes the place of the fluid in the centrifuge tube. This centrifuging and washing of the deposit is repeated seven or eight times; otherwise cutaneous allergy to rabbit serum may be induced by a long course of injections of the flocculated E.B.'s.

Further particulars of the preparation of this flocculated E.B. antigen, or sensitised E.B. vaccine, were given by Gordon (1936).

Craigie and Tulloch (1931) found that the combination of vaccinia virus with its antibodies produced a solid immunity against vaccinia without lesion of any kind.

This has been confirmed many times by me; but, since the object in view was not prevention but treatment, the therapeutic value of the flocculated E.B. antigen was tested by inoculating different sets of rabbits cutaneously with falling doses of vaccinia and Shope-fibroma viruses and then, when the eruption was just beginning, administering a dose of the homologous flocculated E.B.'s. In both instances evidence was obtained that the homologous E.B.'s, united with their antibodies, had a clear, though transient, restraining or inhibiting effect on the lesions developing from the minimal doses. This was in sharp contrast in each case with the effect of the E.B.'s alone, which aggravated the lesions; hence, as with similar antigen-antibody preparations of bacteria, the benefit was entirely due to the antibodies of the combination.

The disease in which the most extensive trial of homologous E.B.'s united to their specific antibodies has been made is Hodgkin's disease, where, after other infections had been excluded, the lesions of acute cases were found to be swarming with E.B.'s. The late Dr. A. C. Coles, perhaps our leading medical microscopist, confirmed this, and on measuring these Hodgkin bodies found them to be slightly larger than those of vaccinia. Excellent photographs of them, generously provided by Dr. Coles, were included in the paper by Gordon and Gow (1934). We found evidence that in Hodgkin's disease there is an allergic response to these E.B.'s; so antibodies to them were prepared from rabbits, and a suspension of the E.B.'s after being heated to 55°C for 30 min., united with their antibodies during flocculation, and well washed, were put up in a stock suspension in phenol saline, kept in the ice-chest, and diluted for trial. When need arose the stock was replaced by another similarly prepared, and in this way the supply of this E.B. antigen-antibody combination lasted until 1939.

The clinical trials were carried out and reported by Warner (1936). There was evidence once more of a minor degree of allergy to the E.B.'s in advanced cases, but it was much diminished by the presence of the antibodies, and in some cases, especially in the young adults, the temporary improvement was striking. In other cases

the distressing and intractable pruritus improved within a short time of injection of the E.B.-antibody combination, slowly to return and then vanish again with another dose. The benefit is only temporary, for Hodgkin's disease is uniformly fatal in the end; but the evidence was sought with the object of determining the clinical value of the antibodies to the E.B.'s present in such large numbers and apparently in pure culture in the glands removed for biopsy, and the result has confirmed the view that they do in fact represent the actual virus concerned in Hodgkin's disease.

It is hoped that a similar E.B.-antibody combination may some day be tried in rheumatism. The failure of a combination of the hæmolytic streptococcus with its antibodies in rheumatism has been mentioned above.

#### OBSERVATIONS WITH BOILED VACCINIA VIRUS: ALLERGY TESTS

It has been known for some years that, as with the anthrax bacillus, boiling does not destroy all the antigenic property of vaccinia virus. The literature on this subject was reviewed by Gordon (1925).

Torikata found that a soluble portion of vaccine virus extracted from calf-lymph by boiling followed by filtration could stimulate the production of specific precipitin and a slight local immunity in the rabbit.

Observations were resumed in 1917 in Kolle's institute at Frankfurt by Tomarkin and Suarez, who, after thoroughly grinding up vaccine pulp with quartz sand in saline (1 in 10), allowed the suspension to stand for 2 days in the ice-chest, followed by 24 hours at 37°C. It was then divided into two parts, of which one was filtered through paper and a Berkefeld filter, and the other was heated for 15 min. to 100°C in a water-bath and then filtered through paper and a Berkefeld filter. As a control they used a suspension of pulp from a normal cow in the same way. All the extracts were absolutely clear and remained so as long as they were free of contamination. In carrying out the tests, narrow tubes 7 cm. long and 4 mm. wide were used. First the serum was placed in the tube, and then the extract was run in carefully so as to allow a reading to be made at the junction of the two fluids in the manner of the ring test. Room temperature apparently was used. The heated extract gave stronger and sharper readings than the unheated. All the controls were negative.

In human beings vaccinated for the first time the precipitin appeared in the serum in 7-11 days, and continued for 2 or 3 months. Of 415 specimens of serum sent to the institute for Wassermann test 398 proved negative; the others all showed a history of comparatively recent vaccination.

The end-points of the reagents were interesting. Against a specimen of rabbit antivaccinia serum undiluted, the heated extract was positive up to a dilution of 1 in 800; whereas against the heated extract undiluted the serum was positive up to 1 in 15.

Tomarkin and Suarez pointed out that this thermo-precipitin was not likely to be useful for the diagnosis of variola, but suggested that for that purpose a suspension of the contents of a variola pustule after being boiled and filtered would give a positive reaction with antivaccinia serum prepared from the rabbit. These observations will be referred to again below in considering the results claimed in rheumatism when the serum of patients was tested for complement-fixing antibodies to an antigen prepared by protracted autolysis of the liver of a child dead of rheumatism.

The properties of boiled vaccinia virus were next studied from a new direction—that of allergy—by Wilson Smith (1932), who observed that a boiled extract of vaccinia virus produces on the skin an allergic reaction that is specific, since it is only positive in people previously infected by vaccinia virus. Since Hodgkin's disease was then being investigated at St. Bartholomew's Hospital, and evidence was increasing that it is due to a virus, Prof. Wilson Smith's co-operation was invited, and he prepared boiled extracts in the same way from glands of typical and active cases of Hodgkin's disease. These

## ACUTE HÆMATOGENOUS OSTEOMYELITIS

## A METHOD OF TREATMENT

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extracts were carefully tested by Dr. James Maxwell cutaneously on controls and on 20 patients with Hodgkin's disease.

The results are of considerable interest: all the controls were negative, and so also were 17 of the Hodgkin patients, but 3 of them gave positive cutaneous reactions. The point of special interest, however, was that these 3 patients were the only ones holding the disease at bay, so that it was in a resting stage. It seems that their resistance—but not that of the others—was strong enough to respond by a positive cutaneous reaction. This phenomenon appeared to be similar to that observed by von Pirquet, who found that patients with rapidly progressing tuberculosis—e.g., children with tuberculous meningitis—may give a negative von Pirquet reaction. These observations with Wilson Smith's boiled extract were mentioned by Gordon and Gow (1934).

Possibly the results given by a boiled extract of the E.B.'s alone in allergic tests in this and other diseases may provide valuable information for diagnosis and possibly for prognosis also.

## CULTURE AND SELECTIVE ACTION

**Culture.**—For a long time the culture of viruses was restricted to the employment of the whole animal for this purpose, as in the time-honoured example of vaccinia; but a great stride forward has been made since Goodpasture employed chick embryo developing in the egg for this purpose. Perhaps some simpler form of symbiosis will be found, such as the use of cultures of yeast, on which Zilber and Wostruchowa (1933) have reported favourably. In some preliminary experiments in which cultures of thrush in broth at 37°C after 24 hours' growth were inoculated with vaccinia, encouraging results were obtained when a week later the supernatant fluid and the deposit were titrated on the rabbit's skin. The fluid gave negative results, but the deposit, after it had been well broken up, gave evidence of the presence of the virus in abundance; it was apparently growing in the yeast-like cells of thrush. A culture of thrush can usually be obtained by cultivating sputum in acid broth at 37°C.

**Selective Action of Viruses.**—A property that viruses possess to a highly developed degree is an affinity for particular tissues or even cells. Attempts have even been made to classify them according to this preference. Thus the viruses of smallpox and warts are dermatotropic; of poliomyelitis and rabies neurotropic; and of fowl leukaemia cellulotropic. But from what we know of them it seems that, like the bacteria, the viruses tend to become generalised before settling down to a special tissue, and during this invasive or latent stage they may be carried to districts unfavourable for their multiplication. A priori, the causal organism of rheumatism, with its special affinity for fibrous tissue, has perhaps the widest field of all.

(To be concluded)

"In these days everybody agrees that there should be a certain amount of health education. If there is argument it is, who should give it? For my part, I believe that health education should diffuse itself throughout the whole school. The mathematician could teach about the calories, the historian could teach about the history of food, the geographer about the sources; and the scientist should, in my opinion, think much more in terms of biology than in terms of chemistry or physics; and then the classical master could give an account of the various plagues from those that are described in Thucydides onwards. The school physician would have to coördinate this, and should give a formal course of lectures to boys at an age when they are able to understand and appreciate the simple physiological facts."—Dr. R. E. SMITH, speaking at the Royal Institute of Public Health and Hygiene on April 14.

In the autumn of 1945 it became apparent to us that the treatment of osteomyelitis with penicillin in the recommended doses of 80,000–120,000 units daily left much to be desired. Sequestra formation, the development of abscesses and sinuses and progressive decalcification, with pathological fracture, were much too common. The patients survived and looked well, but the local lesion became chronic.

Agerholm and Trueta (1946) showed that penicillin in such doses cannot sterilise the abscesses associated with osteomyelitis. Case 18 in our series is an excellent example of this:

The patient had a lesion in the upper metaphysis of the fibula. He was treated with three-hourly intramuscular injections of penicillin—80,000 units daily. The temperature and pulse-rate were normal by the seventh day, but the fluctuant swelling at the upper end of the leg gradually increased, and radiography showed a progressive and alarming destruction of bone.

After 23 days' treatment, the patient having by then received 1,840,000 units of penicillin, the abscess was opened and the pus examined bacteriologically. Cultures yielded a pure growth of penicillin-sensitive *Staph. aureus*.

Obviously, the penicillin level in the local lesion had not been adequate to achieve a bacteriolytic effect. As Fleming pointed out in his early investigations, pus alone does not interfere with the action of penicillin on bacteria. It may therefore be assumed that the failure to attain an adequate penicillin level is due to some mechanical factor. Therefore we presumed that in the treatment of acute hæmatogenous osteomyelitis the effectiveness of penicillin could be increased by raising the dosage of penicillin, and by removing local factors likely to prevent the accumulation of penicillin in a bacteriolytic concentration.

The planned approach of the Medical Research Council to the problem of subacute bacterial endocarditis and the results of their experiences have impressed us greatly and underlined our impression that in infective lesions in bone the present dosage of penicillin in common use should be greatly increased. In their experience relapse occurred in 70% and 58% of two series of cases treated with 1 mega unit daily for five days and 500,000 units daily for ten days respectively. When, however, 500,000 units was administered for 28 days, the relapse-rate dropped to zero, with an average follow-up period of 114 days.

We do not wish to draw too close an analogy between subacute bacterial endocarditis and acute osteomyelitis, since the organisms and their penicillin-sensitivity differ. The outstanding fact remains that a recalcitrant lesion has been subdued by increasing the dosage of penicillin and by prolonging the course of therapy. We decided to adopt the identical dosage and course in the treatment of acute osteomyelitis and to make no alteration in the dosage to allow for differences in body-weight. This same dosage has also been suggested by Hudson (1945), but we have seen no published statistics of the results obtained by him.

The local effectiveness of penicillin is adversely affected by pus, sequestra, and bone sclerosis. Considerable emphasis is laid by many upon the quantity of pus present, and unless an abscess can be demonstrated clinically they disregard it. We find it difficult to believe that the surgeon's finger can distinguish between

quantities of pus which are important and those which are not.

#### METAPHYSEAL DECOMPRESSION

We believe that all lesions of long bones should be decompressed by drilling at the earliest possible moment. In every case which we have treated, pus has been present, either subperiosteal or intramedullary. We have found metaphyseal decompression under a penicillin umbrella to be harmless.

It is well known that sequestrum formation in osteomyelitis of staphylococcal origin is caused by devitalisation of infected bone. This devitalisation can be effected by staphylococcal toxins, as well as by deprivation of the blood-supply following thrombosis of arteries or veins, by compression of the vessels in the rigid cortical casing of bone, or by the stripping of periosteum from the cortex by inflammatory exudate. Early decompression, therefore, should help, not only to limit the amount of bone involved but also to prevent the formation of sequestra by providing an outlet to the toxins and by relieving pressure on the vessels.

Theoretically there should be an early stage of the lesion when penicillin alone without decompression would suffice. We doubt, however, whether such a stage exists by the time a diagnosis is made, or whether it could be differentiated from a state of affairs which does require decompression.

It is unnecessary to deal at any length with the question of bone sclerosis and its detrimental effect on chemotherapy. Bone sclerosis is one of the reasons why chronic osteomyelitis is so resistant to penicillin. Every effort should therefore be made to avoid it. We think that residual sclerosis of bone which remains for a year and shows no sign of reversion to normal architecture on radiography indicates incomplete eradication of infection.

#### METHOD

The procedure which we have adopted in the treatment of acute hæmatogenous osteomyelitis is as follows:

(1) As soon as the diagnosis has been made, penicillin therapy is begun. Intramuscular injections of 62,500 units of penicillin are administered three-hourly for at least 28 days.

(2) Operation is performed within the next few hours if the patient's general condition will allow.

**Drilling.**—There are two points about the operative technique which we wish to emphasise. (a) The periosteum should not be raised by the operator; the drill can pass through periosteum and cortex, and the avoidance of stripping retains as much as possible of the cortical blood-supply. The metaphyseal level is located and the drilling is performed within  $\frac{1}{2}$  in. of the epiphyseal line. We originally erred by drilling at a considerable distance from the metaphysis and found that the decompression was far less effective. Additional holes are drilled at  $\frac{1}{2}$  in. intervals up the shaft until pus-free marrow is found. (b) We believe that, when the pus has been evacuated, primary suture of the wound is essential if secondary infection with penicillin-resistant organisms is to be prevented. Protection of the bone by splintage is advised, but we have not encountered the extensive decalcification which occurs in cases treated with smaller doses of penicillin.

**Splints.**—For splintage we use, in the lower limb, a crab or right-angle foot-splint if the lesion is near the ankle-joint; a Thomas bed knee-splint for lesions near the knee-joint; and a Thomas abduction frame for lesions near the hip-joint or the pelvis. In the upper limb, a short cock-up or crab splint for lesions near the wrist; and a collar-and-cuff or sling for lesions anywhere else in the limb.

#### ANALYSIS OF CASES

The cases analysed here fall into three distinct groups, our own cases being compared with consecutive cases

treated in the same hospitals by other surgeons using methods of their own choice.\* The three groups are: (1) cases treated with small doses of penicillin and drainage; (2) cases treated with penicillin alone; and (3) cases treated with massive doses of penicillin for long periods and early medullary decompression.

#### SUMMARY OF GROUP 1

Number of cases: 20.

Organisms: *Strep. hæmolyticus* in 1 case (case 8).  
*Staph. aureus* in 19 cases.

Satisfactory results: 2 cases (10%).

Penicillin dosage: 1.1 † and 4.52 mega units; average 2.8 mega units.

Duration of therapy: 11 † and 17 days; average 14 days.

Average stay in hospital: 43.5 days.

Unsatisfactory results: 18 cases (90%).

Clinically satisfactory but radiologically unsatisfactory: 6 cases—all show sclerosis.

Clinically and radiologically unsatisfactory: 12 cases.

Flares: 4 cases—all with sclerosis, 1 with sequestrum.

Sinuses: 8 cases—all with sclerosis, 4 with sequestra.

Penicillin dosage: 0.5–16.79 mega units; average 2.86 mega units.

Duration of therapy: 4.5–57 days; average 15.4 days.

Average stay in hospital: 163 days.

#### SUMMARY OF GROUP 2

Number of cases: 9.

Satisfactory results: 4 cases (44%).

Penicillin dosage: 10.5–15 mega units; average 13.4 mega units.

Duration of therapy: 21–38 days; average 28.7 days.

Stay in hospital: 32–61 days; average 44.2 days.

Unsatisfactory results: 5 cases (56%).

Septic arthritis: 2 (joint destruction with sclerosis).

Flares: 2 (with radiological sclerosis).

Persistent local tenderness: 1 (with radiological sclerosis).

Penicillin dosage: 0.4–16 mega units; average 4.82 mega units.

Duration of therapy: 5–33 days; average 22 days.

Stay in hospital: 12–700 days; average 263 days.

#### SUMMARY OF GROUP 3

Number of cases: 10.

Organisms: *Strep. hæmolyticus* in 1 case (case 35).

*Staph. aureus* in 9 cases.

Satisfactory results: 7 cases (70%).

Penicillin dosage: 14–29.5 mega units; average 16.3 mega units.

Duration of therapy: 28–53 days; average 32 days.

Stay in hospital: 29–93 days; average 47 days.

Unsatisfactory results: 3 cases (30%).

Clinically all cases satisfactory.

Slight cortical and cancellous sclerosis.

Penicillin dosage: 15–25.5 mega units; average 18.5 mega units.

Duration of therapy: 30–51 days; average 37 days.

Stay in hospital: 36–69 days; average 48.6 days.

These three groups are further compared in the accompanying table.

\* Tables showing details of treatment and results in individual cases will be supplied by THE LANCET office on request.  
† Infection due to *Strep. hæmolyticus*.

#### SUMMARY OF TREATMENT AND RESULTS

Group	No. of patients	Surgery	Penicillin dosage (mega units)	Duration		Period of follow-up (months)	Percentage satisfactory results
				Penicillin (days)	Days in hospital		
1	20	Incision, window, drilling	2.85	15.2	151	21	Clin. 40 % Radiol. 10 %
2	9	Nil	8.62	25	166	17	Clin. 44 % Radiol. 44 %
3	10	Drilling	17	33.4	47.4	12	Clin. 100 % Radiol. 70 %



## DISCUSSION

It has been difficult to obtain a reliable guide as to how long penicillin therapy should be continued. McAdam (1945) and Aird (1945) by medullary aspirations and cultures have demonstrated that bacteria survive two weeks' penicillin therapy with the usual doses of 120,000 units a day. Medullary aspiration, however, is not a simple procedure and is insufficiently reliable to warrant its routine use as a guide to duration of penicillin therapy. In our opinion the temperature, pulse-rate, and clinical well-being of the patient can be very misleading. Analysis of the cases in group 1 shows that treatment for 14 days is inadequate, and in group 2 there have been two serious complications when penicillin was administered for 30 and 33 days. In all these cases dosage has been on the small scale. From our limited experience we have not sufficient information to decide whether the duration of therapy can be reduced if the dosage is increased.

We have noted that the erythrocyte-sedimentation rate (E.S.R.) bears a much more direct relationship to the severity of the lesion than any other measure previously mentioned. It has been found to return to normal within three weeks in those cases which have progressed favourably and have withstood the test of time. It has remained elevated in cases which have done badly. In some of our cases we have prolonged the administration of penicillin until the E.S.R. has returned to normal. We are not in a position to recommend its use as an infallible guide to the duration of therapy but feel that it is worthy of further study.

Objection may be made to the massive dose of penicillin used. We do not imply that our dosage is the ideal one, and further experience may show that economies may be safely made. Our experience with the treatment of chronic osteomyelitis is so disappointing that we regard the few extra shillingsworth of penicillin in acute cases as likely to pay handsome dividends. The reduction in the period of stay in hospital, the elimination of complications, and the superior results obtained are in our opinion adequate justification for the small additional cost of the penicillin used.

An analysis of group 3 reveals that the institution of surgery has not led to the sequestration and septic arthritis as experienced by McAdam (1945). We are convinced that adequate metaphyseal decompression, with the avoidance of periosteal stripping, is quite safe in conjunction with a daily penicillin dose of 500,000 units. Further, we feel that the results are better than those obtained with penicillin alone. The object of decompression is to evacuate pus, to prevent sequestration by relief of tension, to eliminate toxins, and to improve the blood-supply.

All cases in group 3 had primary closure of the wounds; all healed by first intention. We strongly support Agerholm and Trueta's (1946) recommendation that primary closure is safe and desirable. Secondary infection is avoided, sinuses do not form, nursing duties are curtailed, and stay in hospital is reduced.

We have included only those cases which have been followed for ten months or longer. Assessments made at an earlier date are of less value. Most of the cases have been followed up for at least a year. We have several others of shorter duration, and for the most part the results obtained are identical to date with those presented here. It must be stated that we have recently had two cases which have not done well, but the patients had been ill for a week or longer before treatment was begun. Neither surgery nor massive penicillin therapy can undo the damage done by delay. The need for early diagnosis and immediate therapy appears to be obvious. Acute hæmatogenous osteomyelitis must still be regarded as a surgical emergency calling for extreme vigour in the management of its initial stage.

## SUMMARY AND CONCLUSIONS

In a review of 39 cases of osteomyelitis the various methods of treatment have been compared and the results contrasted.

The highest percentage of satisfactory results and the shortest stay in hospital were obtained in the cases in which penicillin was administered in daily doses of 500,000 units for at least 28 days.

Early metaphyseal decompression in conjunction with a long course of penicillin gives improved results.

The erythrocyte-sedimentation rate returns to normal within three weeks in the cases which progress favourably; it remains raised in cases which tend to progress unfavourably.

There were no deaths in the series.

We wish to thank Prof. T. P. McMurray, without whose guidance and coöperation this study could not have been undertaken.

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## PRIMARY ATYPICAL PNEUMONIA

## A CLINICAL STUDY

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THE term "primary atypical pneumonia" has been applied to those forms of pneumonic consolidation in which the ætiology remains unknown, in which no bacterium, rickettsia, or virus may be incriminated.

Drew et al. (1943) and Fleming et al. (1945) review the literature and point out that, though a similar condition was first described by Bartels (1861), there was little further mention of it in this country till Scadding (1937) described cases of acute interstitial pneumonia and benign circumscribed pneumonia. Further observations have taken place chiefly in America, where there were outbreaks in colleges in 1938-40. The disease was practically unrecognized in this country till the war, and opportunities for its study have occurred chiefly in the Armed Forces. This paper is based on 58 cases, 44 of them in men from the same unit.

## ÆTIOLOGY

No agent has been identified as the specific cause; but primary atypical pneumonia is thought to be a virus infection, and a similar clinical and radiological picture has been observed in psittacosis (Eaton et al. 1941), chorio-lymphocytic meningitis, influenza, and smallpox (Howat and Arnott 1944). Possibly a specific ætiological agent is responsible in cases unassociated with other disease. The United States Commission on Acute Respiratory Diseases (1945) showed that bacteria-free filtrates from throat washings in cases of atypical pneumonia could reproduce the disease in man.

Of special interest is the work of Robbins and Ragan (1946), who investigated five outbreaks of atypical pneumonia in Italy during the winter and spring of 1944-45 and showed, by demonstration of specific antibodies in the blood of convalescent patients and by the isolation of rickettsia in guineapigs, that they were due to a rickettsia resembling *R. burneti*, the causal agent of Q fever.

## EPIDEMIOLOGY

This paper is based on cases in troops in the Naples area in March, 1946. Previous workers had observed a seasonal incidence, most of the cases occurring in spring. Fleming et al. (1945) noted a large incidence of infective

hepatitis immediately before the epidemic of atypical pneumonia, whereas Adams et al. (1946) observed the rising incidence of primary atypical pneumonia to coincide with a decline of infective hepatitis. In the present series, during the outbreak, there were no fresh cases of infective hepatitis in the area. Most cases occurred in the same unit. These troops were housed in contiguous buildings and slept in large dormitories, but no bed-to-bed or room-to-room spread could be traced; nor did there appear to be any spread among those who, though sleeping in different dormitories, were in the confined atmosphere of an office together during the day. The hygienic and sanitary arrangements were adequate, and at that season there were very few flies.

The cases were distributed as follows:

Date of onset	No. of cases	Date of onset	No. of cases	Date of onset	No. of cases
March 4	1	March 11	5	March 18	1
" 5	7	" 12	1	" 19	2
" 6	3	" 13	2	" 20	2
" 7	6	" 14	2	" 21	1
" 8	6	" 15	1	" 22	2
" 9	3	" 16	1	" 25	2
" 10	6				

It will be seen that there is a peak between March 7 and 11, with a slight recrudescence between the 19th and the 22nd.

#### INCUBATION PERIOD

The incubation period has been variously estimated as between seven and twenty-one days (Daniels 1942). In the present series there were 2 cases of apparent cross-infection in the ward. The first was in a patient who had been in hospital since Feb. 21 with a pyoderma of the leg; he developed atypical pneumonia on March 19. The second was in a member of the hospital staff, who developed atypical pneumonia on March 21. These patients were the only ones in their units to develop the disease, and therefore it is justifiable to assume that they received the infection from cases in the ward. This would place the incubation period as less than fifteen days.

Further evidence comes from 2 patients from the unit which was most severely involved. One of them had been in hospital since Feb. 25 and was convalescent from tonsillitis when he developed atypical pneumonia on March 7—i.e., ten days after leaving his unit. The other developed the disease on March 10, having been detached from his unit and stationed in Greece since Feb. 26. In these patients the incubation period appears to be between ten and twelve days.

#### CLINICAL FEATURES

With many cases occurring in a relatively short time, it became possible to recognise the disease earlier and more easily. The onset is abrupt, and the patient presents, when first seen, only severe constitutional symptoms. He complains of severe headache and alternate sweating and shivering. The headache is, indeed, the most prominent and distressing symptom throughout. It is usually frontal or occipital, occasionally retro-ocular, and the patient may complain of some neck stiffness. The temperature is raised to 103–104°F, the pulse-rate seldom more than 100, but the respirations remain unchanged. He will usually confess to a slight dry cough but will seldom volunteer this information. There is almost complete anorexia, with occasional vomiting. Physical examination is often negative.

During the next two or three days the temperature may be maintained but more usually is intermittent or remittent, reaching 99–100°F once or twice within the twenty-four hours and accompanied by drenching sweats. Despite this fever and the very severe headache, the

general condition is surprisingly good, the face flushed, the eyes bright, and the mind unclouded. The cough continues; it is seldom very painful but may be accompanied by a tight feeling round the chest or a sensation of substernal pressure. Occasionally a stabbing pain, worse on inspiration, is experienced, and rather more often a dull nagging may be felt, which is invariably situated over the site of the lesion.

Examination at this stage will usually show physical signs in the chest. There may be a mild generalised bronchitis, or a localised area of high-pitched and medium-pitched rhonchi, or an area of sticky crepitations (Turner 1945). Often the bronchitic signs, which may be unilateral, and the area of rhonchi will be superseded within twenty-four hours by crepitations. The percussion note may be impaired, but signs of consolidation are absent. The crepitations should be searched for diligently and often, in view of the fact that they may occur in an area only the size of half a crown and, though usually persistent, may be fleeting. When heard, these localised sticky crepitations are characteristic.

Examination of the abdomen may reveal an enlarged, slightly tender, and firm spleen, usually palpable 1–2 in. beneath the costal margin. Rarely a transient enlargement of the liver develops. After an indefinite period, usually between six and eleven days, the temperature settles by lysis, and convalescence is uneventful. Sputum, an occasional sign, may be bloodstained.

#### ANALYSIS OF CLINICAL FEATURES

*Onset.*—Drew et al. (1943) and Owen (1944) have described three types of onset: those with pyrexia and severe constitutional symptoms; those with symptoms of an upper respiratory infection; and those with hæmoptysis and pain in the chest. In the present series the onset has been abrupt and presented as a pyrexia of unknown origin. This is in agreement with the series published by Fleming et al. (1945) and Turner (1945).

*Headache.*—This has been constant in all cases. It has been frontal in 29 (50%), frontal and occipital in 12 (20%), and occipital alone in 8 (14%). In 6 (10%) it has been generalised, and in 3 (5%) retro-ocular. Stiffness of the neck was complained of in 5 cases.

*Cough.*—In the early reports cough was described as harassing and paroxysmal. More recent observers have noticed that it was slight or absent (Fleming et al. 1945) or persistent but not troublesome (Drew et al. 1943, Turner 1945). In our series cough occurred in 83% of cases. It was slight, not painful, and usually only admitted on questioning. In 60% of cases its onset was on the first day of the illness; in the remainder it began on the second, third, or fourth day. Only 1 patient complained of cough before the onset of pyrexia.

*Sputum.*—The American reports emphasise the presence of scanty tenacious mucoid sputum at the onset, later becoming profuse and purulent. Drew et al. (1943) observed that it was usually mucoid, it might be bloodstained, even a frank hæmoptysis might occur, but that rusty sputum was not found. Fleming et al. (1945) noted that the amount was correlated with the severity of the illness and the extent of the lung lesion. Curnen et al. (1945) report sputum in 82% of cases, bloodstained in 25%. In the present series sputum in an appreciable amount was very uncommon, no case of frank hæmoptysis occurred, but the sputum was bloodstained in 5 cases.

*Pyrexia.*—The duration of pyrexia was from four to eleven days as follows:

Duration of fever (days)	4	5	6	7	8	9	10	11		
No. of cases	..	..	1	3	8	11	9	18	7	1

• Drenching sweats accompanying the twice-daily falls in the pyrexia were a notable feature. Scadding (1937) observed that it was extraordinarily profuse. The

highest temperature was 105.2°F. The pyrexia usually settled by lysis in the last forty-eight hours. Associated with the pyrexia was a striking relative bradycardia, the pulse being full and regular, the rate being usually between 90 and 100, seldom above 110 per min. This is essentially in agreement with other observations.

**Anorexia, Nausea, and Vomiting.**—In 37 cases (64%) the appetite was completely absent or very poor. As Turner (1945) remarks, anorexia may be as complete as in infective hepatitis. Adams et al. (1946) note anorexia to be a constant prodromal symptom. Vomiting occurred at the onset in 10 cases but never persisted.

**Pain in Chest.**—This occurred in 19 cases (33%). In 9 cases it was dull and nagging, situated where the pulmonary lesion later proved to be, and accompanied by a tight sensation round the chest; 2 patients described it as "stitch-like"; 3 patients had an indefinite sub-sternal soreness; 4 had stabbing inspiratory pain, aggravated by coughing; and 1 patient, in whom splenomegaly was observed, complained only of pain in the splenic area and the left shoulder-tip.

**Pulmonary Signs.**—The elicitation of pulmonary physical signs is of cardinal importance in the diagnosis of primary atypical pneumonia. Only 4 cases showed no signs throughout; in the remainder they were sufficiently characteristic, in conjunction with the symptoms and the temperature chart, to enable a diagnosis to be made on clinical grounds alone.

Radiography offers the most valuable confirmatory evidence, but a shadow suggesting consolidation, be it of a type commonly associated with atypical pneumonia, is insufficient evidence on which to establish a diagnosis. Partial pneumonias or pneumonias of bacterial origin and confined to a bronchopulmonary segment are radiologically indistinguishable from primary atypical pneumonia, and an overconfident and unjustified report from the radiologist about the type of pneumonia may lead to the omission of chemotherapy and consequently to the death of the patient. Owen (1944) observed that the belief that radiography was the sole means of diagnosis was altogether too prevalent. Fleming et al. (1945) note that at first the signs were missed until radiography had shown the site of the lesion, but that later the significance of localised signs was realised, thus making the diagnosis possible before radiological confirmation. The signs usually appeared early, as follows:

Day of illness on which signs appeared .. .. .	1	2	3	4	5	6	7
No. of cases .. .. .	2	18	10	6	6	5	1

(In 6 cases there was no record of the day on which physical signs appeared.)

Thus, of these 48 cases 36 (75%) had physical signs within the first four days of the onset of the illness. The significance of this may be more fully appreciated when it is stated that 80% of cases were not admitted until the second, third, or fourth day of the illness—i.e., most patients presented physical signs on admission to hospital. The histories show that 8 patients were in hospital twenty-four hours, 6 patients forty-eight hours, and only 4 so long as four days before physical signs were found. The characteristic sign was localised "sticky" crepitations, developing firstly at the end of a deep inspiration but later throughout the whole of inspiration and sometimes throughout the whole respiratory cycle. There was no correlation between the signs in the chest and the severity of the illness. These crepitations were the sole sign in 47 of the 58 cases. In the other cases signs of local or generalised bronchitis developed on the second or third day and were later superseded by crepitations. The signs seldom persisted for more than two weeks, but occasionally they lasted well into convalescence and were present even when resolution was complete radiologically.

**Splenomegaly.**—Splenomegaly has been noted before in primary atypical pneumonia. Longcope (1940) records an incidence of 12% and Owen (1943) reports a palpable spleen in 8 of 16 patients. Turner (1945) notes that the spleen was often palpable during the febrile stage. In the present series splenomegaly was observed in 18 cases (31%).

Repeated blood slides were made in all cases to exclude malaria, as most of the patients had been in malarious areas during the last two or three years. There were no cases of coexistent malaria. The enlargement was apparent in 10 cases on the second or third day of illness, in 3 patients on the fourth day, and in 2 patients on the sixth day. The spleen was never grossly enlarged, being firm rather than hard, and slightly tender. The enlargement persisted for from seven to ten days.

**Hepatomegaly** has been mentioned as a concomitant by Adams et al. (1946). They note 6 cases in which the liver was palpable and 14 in which there was tenderness over the liver. Of these 20 cases 6 had bile in the urine. We observed hepatomegaly in 4 cases. It was not associated with clinical icterus or the presence of bile pigments in the urine; nor did any of the patients confess to a previous attack of infective hepatitis. In all cases the hepatomegaly was transient, and therefore one may assume it to be a manifestation of primary atypical pneumonia. As this is apparently an uncommon finding, the relevant case-records are included in those given below (cases 1-4).

#### ILLUSTRATIVE CASE-RECORDS

**Case 1.**—A gunner, aged 30, was admitted on March 23 with a day's history of occipital headache and shivering.

*On examination:* temperature 103°F, pulse-rate 100, respirations 20 per min.; no abnormal physical signs in heart and abdomen; numerous sibilant rhonchi in upper lobe of left lung.

On the 25th the patient's condition was unchanged; he had anorexia and vomited once. On the 26th his liver was palpable 1 in. below costal margin, and rhonchi in chest had given place to showers of crepitations. White-cell count: 6200 per c.mm. (polymorphs 57%, lymphocytes 39%). Radiography showed an opacity in lower part of left upper lobe. Pyrexia lasted eight days, and on the tenth day of the illness the liver was not palpable. The patient was discharged to his unit on April 15.

**Case 2.**—A sergeant, aged 23, was admitted on March 16, from the same unit, with three days' history of frontal headache, cough, and sweating. Appetite very poor.

*On examination:* temperature 100°F, pulse-rate 100 per min.; showers of crepitations in left axilla; soft liver edge just palpable.

On the 18th signs were unchanged; complete anorexia. Radiography on the 20th showed opacity in left upper lobe. White-cell count: 5300 per c.mm. (polymorphs 67%, lymphocytes 32%). Pyrexia lasted ten days. The patient was allowed up on the 26th, when liver was no longer palpable and there were no abnormal physical signs in chest.

**Case 3.**—A sergeant from the same unit was admitted on March 7 with two days' history of anorexia, frontal headache, and sweating.

*On examination:* temperature 103.2°F, pulse-rate 100 per min.; heart and chest normal; soft tender liver edge palpable 1 in. below costal margin.

On March 8 there were crepitations in right axilla and left infrascapular region. Radiography revealed consolidation of axillary segment of right upper lobe and of lower part of left upper lobe. White-cell count: 9600 per c.mm. (polymorphs 77%, lymphocytes 20%). Pyrexia lasted eight days; the patient was allowed up on March 18. He was discharged to convalescence on April 5, when liver edge was just palpable and radiography showed resolution to be not quite complete. Two weeks later liver was no longer palpable; chest clear.

**Case 4.**—A corporal, aged 25, from the same unit was admitted on March 7 with two days' history of headaches, sweating, and pain in back, left loin, and shoulder.

*On examination:* temperature 102°F, pulse-rate 90 per min.; no abnormal signs in heart and chest, but spleen was

palpable and tender 1 in. beneath costal margin, and liver edge was just felt.

Next day he had a slightly stiff neck, but there were no further physical signs. On the 9th there were crepitations at right apex, and radiography revealed an opacity in this region. White-cell count: 6000 per c.mm. (polymorphs 76%, lymphocytes 19%). On the 28th radiography showed resolution to be complete.

**Case 5.**—A driver, aged 24, who had been in hospital since Feb. 21, complained of headache and shivering on March 19. Temperature was 103.2°F, pulse-rate 120 per min., respiration-rate normal. On the 21st repeated slides for

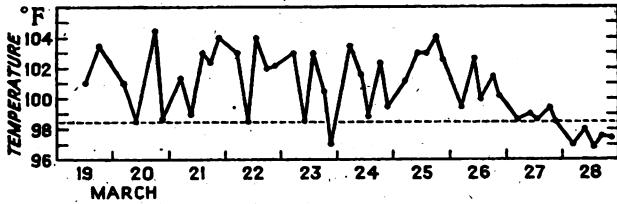


Chart of case 5.

malarial parasites were negative; intermittent pyrexia (see figure) with bradycardia, but no other abnormal physical signs. Next day he had a dull nagging pain in right chest and a slight dry cough. Though uncomfortable he was not distressed. There were showers of "sticky" crepitations in right axilla. Pyrexia continued four more days. On the 26th his white-cell count was 6000 per c.mm. (polymorphs 48%, lymphocytes 48%, monocytes 3%). Radiography showed a dense irregular opacity in right upper lobe, radiating out from hilum.

On April 11 resolution was proceeding rapidly, with no abnormal physical signs in chest. On the 17th he was sent to the convalescent depot.

**Case 6.**—A corporal, aged 29, was admitted on March 11 with a day's history of frontal headache and shivering. No cough; no pain in chest. Temperature 102.4°F, pulse-rate 100 per min.; medium and high-pitched rhonchi throughout chest, not especially marked in any area. On the 13th the signs persisted, and there were, in addition, crepitations low down on the right, posteriorly. Next day soft and slightly tender spleen was palpable 1 in. below costal margin. On the 16th a white-cell count gave 5200 per c.mm. (polymorphs 71%, lymphocytes 25%). Radiography showed an opacity in right lower lobe.

Twelve days later radiography showed resolution to be practically complete. The patient was discharged on April 2.

**Case 7.**—A sergeant, aged 26, was admitted on March 15 with a day's history of frontal headache and shivering. Slight dry cough, but no pain in chest. Temperature 102°F, pulse-rate 90 per min. Fine persistent inspiratory crepitations just below the right clavicle. Radiography showed an opacity in right upper lobe.

On April 2 his white-cell count was 8400 per c.mm. (polymorphs 59%, lymphocytes 34%), radiography showed resolution to be complete, and the patient was discharged to his unit.

INVESTIGATIONS

Owing to the shortage of laboratory and technical staff, investigations were limited to the exclusion of malaria at the onset, the white-cell count, and radiography.

**White-cell Count.**—This confirmed previous observations (Turner 1945, Leake and Blatchford 1943, Correll and Cowan 1943). In all cases it was within the normal upper limit; in a few there was a mild leucopenia. Curnen et al. (1945) found it to be less than 9000 per c.mm. in 55.5% of cases. In the 48 cases in which it was done in this series it was as follows:

White cells (thousands per c.mm.)	3-4	4-5	5-6	6-7	7-8	8-9	9-10	10-11
No. of cases	1	4	10	15	6	7	3	2

These figures are very similar to those published by Turner (1945). The differential count was normal, there

being no constant feature which might be taken to be characteristic of the disease.

**Radiography.**—The radiological appearances have been described by Lewis and Lusk (1944), who point out that there are two types of lesion, both associated with enlargement of the hilar glands: (1) a homogeneous ground-glass opacity, through which lung markings are still visible; (2) a group of patchy flocculent opacities. They noted that the lesion tended to follow a bronchial distribution and was bilateral in 20% of cases. Drew et al. (1943) noted that the lung fields were often normal between the lesion and the enlarged hilar shadow, but Dingle and Finland (1942) found that the process often began at the hilum and fanned out. Both Curnen et al. (1945) and Owen (1944) note a predilection for the lower lobes, Owen giving an incidence of 50% in the left lower lobe. They describe involvement of two lobes in 35% of cases, and three, four, or five lobes in 7.5%, 3.8%, and 5.7% of cases respectively. Fleming et al. (1945) found the lesion to be on the right in 56% of cases, chiefly in the upper and middle zones; and in the present series the results were in agreement with his observations, the right lung being involved in 35 cases (59%), the right upper lobe in 15, the right lower lobe in 11, and the right middle in 3. In 3 cases the right upper lobe was involved with the left upper lobe, in 1 with the left lower lobe, and in 1 all lobes of the right lung were involved. The radiological appearances were similar to those described above: in 50% of cases the lesions spread out fanwise from the hilum; in the remainder there was a variable area of normal lung tissue between it and the hilum. The homogeneous ground-glass type of opacity with indefinite margins (unless it bordered on a lung fissure) was much more common (70%) than the dense woolly circumscribed type of lesion. Bilateral opacities were seen in only 4 cases and did not influence the severity of the illness. Resolution usually took place in four or five weeks.

COMPLICATIONS

Complications are unusual. Meningism, encephalitis, jaundice, rashes, and pleural effusions have been described. Kay (1945) reports 20 cases of bronchiectasis which could only be traced to a previous attack of atypical pneumonia. Glendy et al. (1945) described cases complicated by pleural effusion with subsequent abscess formation, empyema, and death. In our series only 2 patients presented complications. One, a man aged 35, developed delirium tremens on the fourth day, which was controlled by intramuscular paraldehyde. He confessed to being a heavy drinker of spirits. The other developed thrombosis of the superficial veins of the calf on the twelfth day, which responded to continued rest in bed.

POST-MORTEM APPEARANCES

No deaths took place in this series. Interstitial bronchopneumonia with bronchitis has been described, with infiltration of the interalveolar septa with mononuclear cells, and a similar mononuclear exudate in the alveoli.

DIFFERENTIAL DIAGNOSIS

Diagnosis does not present much difficulty during an epidemic like that described here, when many patients from the same unit were admitted with similar symptoms. The diagnosis of sporadic cases would prove more difficult. The exclusion of malaria by repeated blood films is of primary importance, especially where, as in this series, the patients had served in malarious areas. The temperature chart, in association with signs of bronchitis, may suggest the enteric group of fevers. Blood-culture may be necessary to exclude typhoid, but usually the signs will be sufficiently characteristic within a day or two.

In cases with intense occipital headache and stiffness of the neck, *meningitis* or the early stages of *poliomyelitis* may be simulated. If meningism is severe, these can only be excluded by lumbar puncture, but again the localising signs in the chest will prove of value. Radiography provides an essential step in the confirmation of the diagnosis. It cannot be over-emphasised that it must be taken in conjunction with the clinical picture.

The diagnosis of *bronchopneumonia* showed a corresponding decrease as the incidence of primary atypical pneumonia rose. The white-cell count may occasionally be normal in bronchopneumonia, as in primary atypical pneumonia, but cough, dyspnoea, and pain in the chest are pronounced, the pulse-rate is raised, and the patient is ill. Cases of segmental pneumonia of bacterial origin may give rise to difficulty, as they may be radiologically indistinguishable from primary atypical pneumonia and have little respiratory distress. In these cases the white-cell count is usually of value. Although the total count may not be grossly raised, the percentage of polymorphs is, and a differential count of over 85% polymorphs is strongly in favour of a bacterial origin. The greatest help was found in the general appearance of the patient, and the constant relative bradycardia.

*Tuberculosis* is occasionally difficult to exclude. The termination of the pyrexia, the negative results of sputum examinations, and serial radiography showing rapid resolution will establish the diagnosis.

In patients who present with anorexia, nausea, and vomiting, and in whom the liver edge is palpable, the greatest difficulty may be found in differentiating from *infective hepatitis*. In Italy cases of anicteric hepatitis were not uncommon. The diagnosis of primary atypical pneumonia rested on the knowledge that it could closely simulate anicteric hepatitis and therefore on a search for pulmonary signs and confirmation by radiography.

#### TREATMENT

No treatment is necessary beyond symptomatic measures. Sulphonamides and penicillin are ineffective. They were not exhibited in this series, as previous experience had shown them to be of no value. It has been suggested that, because the diagnosis cannot be made with certainty in the first few days, they should be exhibited as a therapeutic test and to avoid missing a pneumococcal pneumonia. With increasing assurance of diagnosis this hit-or-miss method of therapeutics appears irrational.

#### DISCUSSION

Since the outbreak was sharply limited in space and time, 75% of cases occurring in the same unit, it is highly probable that the responsible agent was the same in every case. The constancy of the clinical picture was striking, and it is felt that the clinical evidence thus accumulated is more reliable than in cases spread over many months and throughout wide areas.

Diagnosis on clinical grounds is possible in a high proportion of cases and is desirable, since confirmation by radiography may be delayed and there is no single pathognomonic radiological sign. Earlier reports have described cases which do not fit into the clinical picture here defined. Those with purulent sputum, high white-cell counts, and a polymorph leucocytosis, and those progressing to abscess formation and empyema are not, it is suggested, cases of the disease described here. They belong to a group of, as yet, ill-defined partial and segmental pneumonias of unknown origin but which may be associated with various aetiological agents. To this group primary atypical pneumonia has hitherto belonged. Though it is impossible to separate it on

aetiological grounds, the picture is sufficiently constant for it to be regarded as that of a single disease.

This view is confirmed by the work of Robbins et al. (1946), who noted that certain clinical features which they observed in outbreaks of atypical pneumonia in Italy did not correspond to the previous descriptions of this disease. They demonstrated in such cases the presence of the rickettsia of Q fever, and concluded that "Mediterranean Q fever occurred as a sporadic disease in southern Italy in the vicinity of Caserta and Naples, and that it made up a significant proportion of the cases given a diagnosis of atypical pneumonia in this area." The cases they describe are very similar to those of the present series, which occurred in the Caserta-Naples area. Possibly, therefore, these were cases of Mediterranean Q fever; but, as we were unaware of the American investigations at the time, no laboratory examinations were performed to substantiate this view.

Of some interest in this outbreak were the points which suggest an affinity with infective hepatitis: (1) the sharp decline in incidence of infective hepatitis; at no time during the preceding months had there been a period as long as two weeks without fresh cases of infective hepatitis; yet, with the onset of this explosive outburst of primary atypical pneumonia, the incidence fell to zero, and fresh cases of infective hepatitis only occurred in the area after the subsidence of the epidemic; (2) the uncommon but undoubted enlargement of the liver; and (3) the relatively common complete anorexia, such as, in our experience, only develops in the early stages of infective hepatitis. The possibility cannot be ruled out that some of the febrile cases of anicteric hepatitis, which were not uncommon in Italy, were really cases of primary atypical pneumonia. The diagnosis can only be made if the occasional similarity of clinical features is recognised. No final conclusion may be drawn from these observations but they do suggest that the virus, if so it be, causing atypical pneumonia is closely related to that of infective hepatitis.

#### SUMMARY

A localised outbreak of primary atypical pneumonia is described.

Hepatomegaly was observed in some cases.

The possible relationship of the disease to infective hepatitis is discussed.

It is concluded that the features are sufficiently characteristic for primary atypical pneumonia to be diagnosed clinically and regarded as a distinct disease.

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## MASTOID SURGERY—OLD AND NEW

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**RADICAL mastoidectomy** is one of the most unsatisfactory operations in surgery. Before the operation the patient is more or less deaf and has a troublesome otorrhœa; after the operation he finds himself just as deaf, if not deafer, and only too often the discharge continues unabated. Patients may well ask what is the justification for such a serious operation.

To answer this question we must examine the circumstances in which radical mastoidectomy was conceived. Up to the middle of the nineteenth century mastoid surgery was practically never performed. In 1853 Wilde, the famous Dublin otologist, condemned surgical perforation of the mastoid for mastoiditis, saying: "As the success attending this procedure must be very doubtful and the hazard very great, it is never resorted to in the present day." Toynbee, equally famous, admitted he had never performed the operation, but declared that he would do so if the patient's life was obviously endangered.

It was not until 1873 that Schwartz crystallised the conception of a simple mastoidectomy for acute purulent mastoiditis, and a further twenty years elapsed before Stacke and Zaufal independently published their accounts of the operative treatment of chronic suppuration. The Stacke-Zaufal, or radical mastoid, operation is now performed as a routine measure in all otological clinics, and little is known of the severe criticisms it evoked fifty years ago.

Korner in 1899 wrote:

"The operation must be classed among those involving much difficulty and responsibility. Certain pure specialists have condemned the operation as a mischievous departure. Certain prominent surgeons, lacking the needful otological knowledge, have been constrained to retreat from this field after meeting with various disasters. But difficult as the operation is, there is no justification for throwing around it a cloak of mystery as if only the elect were ever called upon to perform it."

What drove surgeons to undertake this operation? Was it the hope of restoring or preserving hearing? Certainly not. It was the threat of intracranial complications. The writings of those days are lurid with the descriptions of death from cerebral abscess, meningitis, pyæmia, and so on.

Inevitably the technique adopted was drastic and heroic. The anatomists had demonstrated how widespread the mastoid air-cells might be. They were to be encountered behind and superficial to the lateral sinus, forward and upward into the zygoma, and even inward along the base of the skull to the tip of the petrous bone. Driven by fear of intracranial complications, the otologist was bound to explore every accessible nook and cranny in the petromastoid mass in search of the lurking focus of infection. The result was a large cavity which became infected by the pre-existing suppuration. Then ensued months of wearisome dressings, designed to encourage the formation of a cutaneous lining to the unhealthy granulations which sullenly sprouted over the denuded bone.

This problem is particularly important in the children of the poorer classes, among whom bilateral chronic suppurative otitis media is only too prevalent. These children are a living reproach to modern otology. Every ear surgeon and every school medical officer knows them only too well. Many of them drift ineffectively through school, hampered by their deafness and often ostracised by their fellows because of the offensive otorrhœa, only to enter on adult life with a handicap which grows more burdensome year by year.

This is a gloomy picture, but it is not exaggerated, as the following extract from a standard textbook proves:

"It not infrequently happens that young children suffer from a bilateral chronic otorrhœa which resists persistently all non-operative measures for relief. It has been the custom with these children to perform first a simple mastoid operation on the ear in which the hearing is more impaired, on the theory that the principal pathology is located in the mastoid antrum, and this procedure corrects the otorrhœa in a fair number of instances. If the disease is not eradicated by this means, then a modified radical mastoid operation which completely exposes the antrum should be tried. This failing, we should seriously consider the advisability of performing the radical mastoid operation, selecting the worse ear first and noting the effect on the hearing, and should still further postpone additional operative measures if audition has been seriously impaired unless further complications threaten."

It is easy to detect the undertone of defeat in that description. What a horrible outlook. The child may have to submit to three mastoid operations, with no assurance of a dry cavity in the end. Further, the "effect on audition" is liable to be so bad that the surgeon may have to avoid further surgery. The ear must continue to suppurate, and nothing but the threat of complications justifies further treatment.

Is this the best that modern otology can offer? Surely not. In justice it must be pointed out that the unsatis-

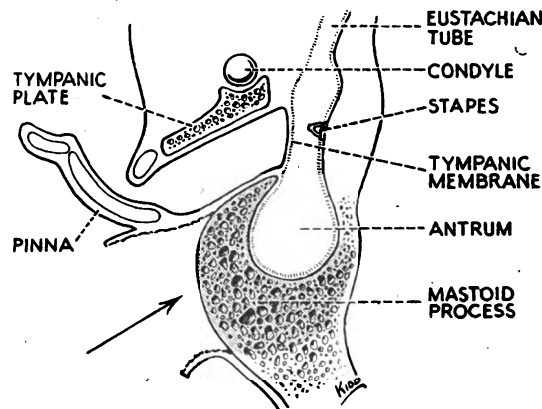


Fig. 1.—Radical mastoidectomy. Note excessive mobilisation of soft tissues and widespread removal of bone (shaded area).

factory functional results of radical mastoid surgery have troubled the consciences of surgeons for the last fifty years. So-called conservative operations have been proposed by Heath, Bondy, Bárány, and others—but all to no avail. The results were if anything worse, and today otologists still perform the classical radical operation with minor technical variations—e.g., in the site of the skin incision and in manipulation of the soft tissues.

### THE PATHOLOGICAL PROBLEM

Let us therefore consider the problem anew. Chronic suppurative otitis media is usually benign; roughly 80% of cases can be cured by conservative treatment—i.e., by simple aural hygiene. It is clear that in these cases the disease must be limited to the soft tissues of the middle ear. What of the remaining 20%? Every otologist knows that most of them are due to localised disease in the ossicles and mastoid antrum. There is no outlying disease, because usually the mastoid is non-pneumatised. The mastoid antrum is present at birth, but the mastoid air-cells develop later. In some infants this pneumatisation does not take place. Probably an upper respiratory infection, associated with gastro-enteritis, sets up a silent otitis media which suppresses pneumatisation. This leads to a diploetic or even an ivory type of mastoid. These are the ears in which chronic suppuration develops; it arises insidiously and not as a sequel to an acute mastoiditis.

The latter arises in the normal pneumatised ear. Surgery in acute mastoiditis—i.e., simple mastoidectomy—must be thorough and radical because the air-cells may be so widespread. By contrast the radical mastoid operation has only to deal with the localised chronic disease in the middle ear and antrum. There are no other infected air-cells. Hence arises the curious paradox that the conservative operation should be as radical as possible and the radical operation as conservative as possible. This dictum was propounded many years ago, but unfortunately has not received the recognition it deserves.

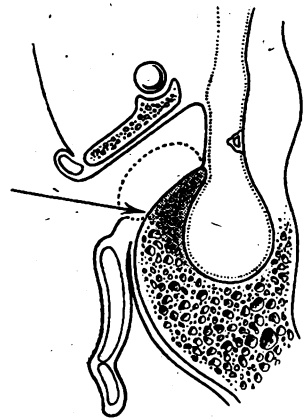


Fig. 2—Transmeatal attico-antrotomy. Note tiny flap (dotted line) directly leading to diseased antrum, and limited excision of bone (shaded area).

Broadly speaking, the simple mastoid operation clears out an acutely infected pneumatised mastoid but does not interfere with the middle-ear contents. By contrast, the radical operation deals (or rather it should deal) with a low-grade chronic infection in the middle ear and mastoid antrum. It is true that neglected chronic suppuration occasionally leads to intracranial complications necessitating very heroic surgery. These cases are extremely rare and merely serve to underline the moral that surgery in chronic suppurative otitis media should not be a last resort. As soon as it becomes obvious that aural hygiene is inadequate, the otologist must operate. But he must do the correct operation. At this early stage the hearing is often excellent and the classical radical operation is extremely liable to lead to a grave loss of hearing. The foregoing discussion enables us to specify the features of a more suitable operation. To begin with, the operation is urgent. Chronic otorrhoea is as urgent as chronic glaucoma. Next it must be a mastoidotomy and not a mastoidectomy. We aim at draining a cavity, not excising a bone. Rapid healing is important; so we must use a small incision with minimal manipulation of soft tissues. Lastly we aim to preserve function; hence, the middle-ear contents must be scrupulously preserved. The operation should start at the tympanic ring, where the disease begins, and should follow the disease wherever it ramifies.

Radical mastoidectomy (fig. 1), as normally performed, does not comply with these requirements. It is usually done much too late, with the result that the hearing is irretrievably lost. A large postaural incision is used with widespread retraction of tissues, and a large hole is cut in the dense bone so as to reach the diseased area. When that point is reached, the functioning structures of the middle ear lie deep in a conical cavity. Blood is seeping on to them, and it is difficult to deal carefully

with them. It is not surprising, therefore, that the results of this operation are poor.

AN ALTERNATIVE OPERATION

These considerations lead inevitably to the alternative conception of transmeatal attico-antrotomy (fig. 2). We plan merely to excise the thin wedge of bone which is denying us access to the subjacent soft tissues of aditus and antrum. Provided we operate without excessive delay, the resulting access will enable us to cure those diseased soft tissues by the same simple aural hygiene as proves successful in the above-mentioned 80% of cases. The operation must, however, be flexible—i.e., we must be able to extend its scope to deal with more extensive disease, if present.

During the past twelve years I have performed transmeatal attico-antrotomy in over 300 cases, and I am now convinced that it is a far more satisfactory operation than radical mastoidectomy. Transmeatal attico-antrotomy is performed as follows:

The incision begins at Shrapnell's membrane and curves up to the roof of the osseous external auditory canal (fig. 3). From there it passes outwards and backwards and finally downwards so as to demarcate a tiny semi-oval flap. This is elevated and then rolled out of the way on the floor of the meatus, thus exposing the outer attic wall. Beneath this thin wedge of bone lies the diseased area.

Fig. 3 shows a polypoid granulation sprouting from it, and fig. 4 shows how removal of a few semilunes of bone carries this diseased mass away and begins to bring into view the incus and stapes.

In favourable cases nothing more need be done, but in neglected cases the incus and malleus are diseased and must be removed. Diseased cells are sometimes found extending in various directions from the antrum, and it is easy to follow them up and clear them out.

The operation is completed by rolling the skin flap into place in the floor of the cavity. This protects the raw edge of bone and provides a base from which epithelisation of the cavity proceeds apace, being commonly complete within 3-6 weeks.

The advantages of this operation are obvious. (1) It starts at the diseased area. (2) The skin flap is about half as big as a postage stamp, the soft tissues are hardly disturbed at all, and the incision is practically bloodless. (3) The bone excision is minimal; hence the opera-

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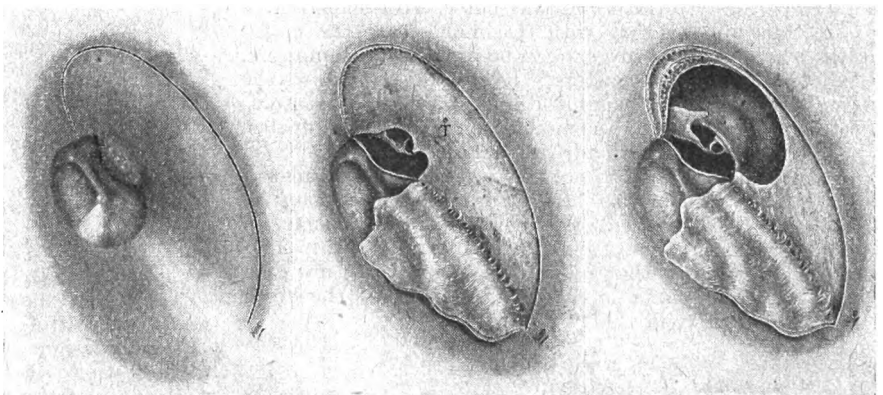


Fig. 3—Transmeatal attico-antrotomy: the incision. Note polyp at postero-superior quadrant of tympanic membrane.

Fig. 4—Transmeatal attico-antrotomy: the "mauvais pas." The flap has been elevated and is now thrust into the floor of the external auditory canal. The first two semilunes of bone have been chipped away, carrying the granulations with them. The long process of the incus comes into view and the crura of the stapes. The antrum could be reached by plunging a dental drill through the postero-superior meatal wall at T—this is not recommended (see text).

Fig. 5—Transmeatal attico-antrotomy: the bone excision completed. Note incus, semicircular canal, facial nerve, and stapes. This shows a comparatively limited excision of bone. The exposure can easily be extended forwards, upwards, or backwards. The strip of bone overlying the head of the malleus would normally be removed so as to gain access to Prussak's pouch.

tion cavity is tiny. The skin flap is meticulously preserved, and the cavity heals very rapidly. This is most important. Long-continued suppuration, such as commonly occurs after radical mastoidectomy, inevitably impairs hearing. The functional results of attico-antrotomy are excellent. (4) The operation scar is invisible. (5) From the patient's point of view it is a minor operation. It takes from 20 to 40 min. The patient is in bed one or two days and can leave hospital on the fifth day. After-treatment is minimal and painless. The first dressing is done after seven to ten days, after which twice-weekly dressings are adequate. Some cases have healed after no more than six dressings in three weeks. This is very important with children, who dread the usual painful mastoid dressings.

In view of these great advantages, it may well be asked why this operation has not been performed before. The answer is that a similar technique has been used sporadically by occasional Continental surgeons for nearly forty years. Unfortunately those pioneers tended to think along classical lines and aimed at extensive clearing operations for hypothetical widespread disease. They naturally encountered and could not refute the valid criticism that mastoidectomy is not feasible through such a constricted approach. The position is entirely different with attico-antrotomy, which is proposed as a drainage operation to be performed at an early stage, the emphasis being laid on the preservation of function rather than on the quest for an improbable outlying infected cell. In fact, so long as the surgeon is satisfied to expose thoroughly the triple cavity of attic, aditus, and antrum as described above, he may confidently expect a higher percentage of satisfactory results than is attained by any other technique.

The second main objection to this operation is its difficulty. It is claimed that there is increased danger to the adjacent vital structures—namely, facial nerve, labyrinth, lateral sinus, and brain. We may reasonably recall the criticisms and Korner's defence of the radical operation fifty years ago. Transmeatal attico-antrotomy is in a similar position today. Disaster certainly awaits any surgeon who attempts this operation without adequate study. Nevertheless Thies cited 1500 cases without a fatality. My own series of over 300 cases includes no deaths or catastrophes, no injuries or infection of the brain, and no injuries to the lateral sinus. Three patients developed facial palsy, but in each case the lesion was trivial and disappeared within three weeks. One patient developed labyrinthitis but was cured with penicillin.

It thus appears that with reasonable care the major disasters of mastoid surgery can be practically eliminated. What of the minor disasters? Every resident knows the troublesome minor complications of radical mastoidectomy: postoperative hæmorrhage, spreading erysipelas, stitch abscess, perichondritis, collapse of the pinna, postaural fistula, and so on. It is true that the advent of the new antibiotics has diminished these troubles but they still occur. By contrast, in transmeatal attico-antrotomy they are practically unknown. This is due to the fact that no ligatures or sutures are ever used and the pinna is never mobilised, all the work being done through the tiny flap.

#### RESULTS

First we must consider what we mean by success or failure. It is not enough to avert intracranial complications. Nor is a dry mastoid cavity a success if the middle ear remains moist. Nor will patients thank us for a completely dry cavity if the hearing has been sacrificed by the operation. We aim at a completely dry tympanomastoid tract with maintenance or improvement of hearing.

Recently we reviewed 50 consecutive cases. We received 42 replies. In no less than 38 cases the mastoid

cavity was healed. In 9 of these, however, the middle ear remained moist. Thus 29 had a completely dry tympanomastoid cleft. Of the 42 replies, 21 reported a definite improvement in hearing, 19 reported no change in hearing, and 2 reported further loss of hearing.

These figures were analysed as follows by the Department of Applied Mathematics, Liverpool University (Prof. L. Rosenhead):

"With data of this nature it is convenient to calculate two limits within which the true proportion—e.g., of moist mastoid cavities—may be expected to lie. More precisely, we give below an upper and lower limit such that, if the experiment were repeated many times under the same conditions and these limits calculated in the same way each time, then the true proportion would lie between these limits in 95% of cases and outside in only 5%. We find:

(1) *Mastoid cavity*: proportion "moist" almost certain to lie between 2% and 24% (and therefore "dry" between 76% and 98%).

(2) *Middle-ear cavity*: proportion "moist" almost certain to lie between 17% and 48% (and therefore "dry" between 52% and 83%).

(3) *Hearing*: with a probability of being correct lying between 92.5% and 97.5% we may assert that the proportion of "improved" lies between 20% and 67%, "unaffected" between 15% and 62%, and "impaired" less than 18% (R. L. Plackett, April 24, 1947).

#### DISCUSSION

It is natural to compare these figures with the results of the classical operation. Unfortunately statistics vary enormously: My own results certainly indicate that the modern operation is superior in every way to radical mastoidectomy.

It is noteworthy that 38 out of 42 mastoid cavities healed over. This is surely proof enough that there is no need to clear the mastoid, and that the boggy of outlying infected cells is without any foundation in fact.

The distinction between pneumatised and non-pneumatised mastoids is admittedly not so rigid as I have suggested; intermediate types certainly occur with various degrees of impaired pneumatisation. The results of attico-antrotomy, however, prove that we are entitled to ignore these subsidiary cells. They recover spontaneously, once the main cavity is adequately exposed and treated. It may be argued that to leave such outlying cells may lead to spreading infection. This theoretical objection proves to have no valid foundation. I have never encountered delayed complications in any of my patients, and in the district from whence they are mainly drawn intracranial complications of any kind are so rare as to be practically unknown.

It has been suggested that these 42 were all mild or early cases, but that is incorrect; 14 patients had had intermittent otorrhœa for over 20 years. Only 1 case was under a year's duration; 13 cases had been running 1-3 years, and the remainder 3-20 years. It is our aim to operate much earlier than this, and I am convinced that, when we do so, the functional results will improve proportionately. Fifty years ago otologists operated to save life. Today we must operate to save hearing.

#### SUMMARY

The radical mastoid operation is condemned as savage and unsuccessful.

It was designed to deal with the threat of intracranial complications—hence its heroic quality.

Because of the magnitude of this operation and of its unfortunate results, patients fear it and surgeons avoid it, until the hearing is lost beyond recall.

Modern otology must approach the problem from the functional aspect.

Transmeatal attico-antrotomy is proposed for this purpose.

It is a minor operation from the patient's point of view. It aims at draining the infected cavities with minimal disturbance of the soft tissues and minimal excision of bone.



It requires meticulous precision, being performed entirely within the confines of an aural speculum. The operation field is rarely more than 8 mm. across.

Figures are cited to show that the operation is not dangerous and the end-results are excellent.

Attico-antrotomy is particularly valuable in children. It should be performed without delay, as soon as it is clear that conservative treatment has failed.

It is not indicated in recurrent infection arising from the eustachian tube.

I am happy to acknowledge my indebtedness to Mr. R. L. Plackett, who provided the statistical analysis; to Mr. H. Zalin, who has assisted me both in the theatre and in outpatients; and to my friend Mr. G. Shone, who patiently prepared the various special instruments without which the operation would have been impossible.

## NEW ANTIBACTERIAL DIAMIDINES

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IN our investigation of the antimicrobial properties of the diamidines we found propamidine to be a useful bactericidal agent. The results were cited by Thrower and Valentine,<sup>1</sup> who demonstrated its clinical value in surface infections. This communication gives our preliminary experimental findings on two new compounds of greater bacteriostatic and bactericidal activity; fuller details of these and other antibacterial diamidines will be published in the *British Journal of Pharmacology*.

The compounds under consideration are (1) propamidine, (2) 2:2'-dibromopropamidine, (3) hexamidine, and (4) 2-iodohexamidine. The isethionates of these compounds are readily soluble, forming colourless neutral stable solutions, but they are precipitated in normal saline unless in very low concentration.

### ANTIBACTERIAL ACTIVITY

*Bacteriostatic activity* was determined by the turbidimetric serial dilutional method in Hartley's broth, with the addition of 2% glucose for streptococci, and by Fleming's slide-cell method with human defibrinated blood as the medium. The highest dilution was noted

1. Thrower, W. R., Valentine, F. C. O. *Lancet*, 1943, i, 133.

2. Elson, W. O. *J. infect. Dis.* 1945, 76, 193.

TABLE I—ACTIVITY AGAINST VARIOUS BACTERIA AND FUNGI

Organism	NOTC* no.	Propamidine	Dibromo- propamidine ‡	Hexamidine	Iodo-hexamidine ‡
<i>Strep. pyogenes</i> .. .. .	2432	(a) 1: 256,000	1: 1,024,000	1: 2,048,000	1: 2,048,000
<i>Strep. viridans</i> .. .. .	3165	(a) 1: 256,000	1: 512,000	1: 1,024,000	1: 2,048,000
<i>Staph. aureus</i> .. .. .	†	(a) 1: 128,000 (b) 1: 64,000	1: 1,024,000 1: 256,000	1: 1,024,000 1: 128,000	1: 2,048,000 1: 256,000
"  "  (in 10% serum) .. .. .		(a) 1: 64,000	1: 256,000	1: 1,024,000	1: 1,024,000
"  "  (in blood) .. .. .		(a) 1: 64,000	1: 256,000	1: 1,024,000	1: 1,024,000
<i>Ps. pyocyanea</i> .. .. .	1999	(a) 1: 4000 (b) 1: 4000	1: 32,000 1: 16,000	1: 64,000 1: 32,000	1: 128,000 1: 32,000
<i>Proteus vulgaris</i> .. .. .	3156	(a) 1: 8000 (b) 1: 4000	1: 8000 1: 4000	1: 8000 1: 4000	1: 8000 1: 4000
<i>Bact. coli</i> .. .. .	4144	(a) 1: 16,000 (b) 1: 8000	1: 256,000 1: 32,000	1: 16,000 1: 16,000	1: 64,000 1: 32,000
<i>Actinomyces madure</i> .. .. .	3255	(f) 1: 10,000	1: 20,000	1: 10,000	1: 5000
" <i>hominis</i> .. .. .	4525	(f) 1: 1000	1: 1000	1: 100,000	1: 100,000
<i>Geotrichum dermatitidis</i> .. .. .	2787	(f) 1: 40,000	1: 5000	1: 50,000	1: 50,000
<i>Trichophyton tonsurans</i> .. .. .	2520	(f) 1: 10,000	1: 40,000	1: 5000	1: 5000

\* NOTO, National Collection of Type Cultures, *Spec. Rep. Ser. med. Res. Coun., Lond.* no. 214. † Isolated from a case of osteomyelitis.

‡ These compounds have been submitted to clinical trial and the results will be published shortly.

(a) bacteriostatic activity; (b) bactericidal activity; (f) fungistatic activity.

Numerals denote highest dilutions giving complete inhibition of growth. Media: nutrient broth for bacteriostatic tests; trypsin-digest agar for bactericidal tests; 2% glucose-agar for fungistatic tests.

**Acquired Resistance to Drugs.**—By repeated serial subcultivations in vitro it is possible to train organisms to increasing concentrations of a drug. Thus dibromopropamide was originally effective bacteriostatically in nutrient broth at 1:1,000,000 against *Strep. pyogenes*, but was effective at only 1:8000 after repeated subcultivations. Similarly, penicillin was initially bacteriostatic at 0.03 unit/ml. against *Staph. aureus* and eventually at 1400 units/ml. after repeated subcultivations. We found, however, that penicillin-resistant staphylococci were susceptible to the diamidines, and that organisms rendered resistant to one diamidine were resistant also to other diamidines but not to penicillin. These in-vitro findings may, though not necessarily, be applicable to clinical practice, where inherently resistant strains may respond in a different manner.

**Toxicity.**—In assessing the toxicity of a compound proposed for local chemotherapy its toxicity to healthy

TABLE II—TOXICITY AND LOCAL TOLERANCE

Compound	Average lethal dose for mice mg./kg.		Minimal toxic concentration (g./100 ml.) for—		
	Intra-venous	Subcutaneous	Human phagocytes	Chick embryo	Guinea-pig skin
Propamidine ..	42	55	0.6	0.4	0.100
Dibromopropamidine ..	10	300	0.1	0.8	0.050
Hexamidine ..	17	62	0.2	0.2	0.025
Iodohexamidine..	6	150	0.1	0.4	0.050
5-aminoacridine..	15	100	0.01	0.1	0.025

tissues, granulations, and phagocytosis is of more importance than systemic toxicity. We have accordingly determined toxicity to mice by intravenous and subcutaneous injection, toxicity to human phagocytes and to chick embryo, and the concentrations causing erythema or necrosis by intradermal injection into guineapigs (table II). For comparison we have included some results with 5-aminoacridine, since penicillin is practically non-toxic.

## DISCUSSION

Though the diamidines are regarded as potentially toxic when used parenterally for protozoal infections, they are well tolerated when applied locally to bacterial surface infections. The amounts absorbed from the skin are unlikely to produce any of the effects caused by injection, and the compounds have been shown experimentally to be much less toxic to tissues than is 5-aminoacridine which has been widely used. As antibacterial compounds the diamidines have the advantage of retaining their activity in the presence of blood, but their bactericidal activity is somewhat less than their bacteriostatic activity. Their lethal action against *Staph. aureus* is fairly rapid, since they reduce, in dilutions of 1:64,000 to 1:128,000, the bacterial count (20,000 organisms per ml.) to 50% of its original value within about an hour. Two new derivatives, dibromopropamidine and iodohexamidine, displayed high bacteriostatic activity against gram-positive bacteria of an order not very much less than that for penicillin, whereas against certain gram-negative bacteria they were more active than penicillin though less active than streptomycin. They therefore seem to be promising new antibacterial compounds suitable for use in surface infections. Also they have comparatively high activity against certain pathogenic fungi and may prove of value in this direction.

## SUMMARY

The antibacterial properties of two new halogenated diamidines, dibromopropamidine and iodohexamidine, are described from the point of view of their possible use in surface infections.

## Preliminary Communication

## THE TREATMENT OF BILHARZIASIS WITH MIRACIL D\*

IN the last decade a considerable amount of work has been carried out in the laboratories of the I.G. Farbenindustrie at Elberfeld on the synthesis and testing of organic compounds for schistosomicidal activity. One compound in particular, developed originally by Mauss, was found by Kikuth and Gonnert to show considerable therapeutic activity for mice and monkeys infested with *Bilharzia mansoni* (Combined Intelligence Objectives Subcommittee, 1945). Since no facilities for clinical trials were available to these workers, the effect of this drug, which was named 'Miracil D' (1-methyl-4-beta-diethylaminoethylaminothioxanthone hydrochloride), on human bilharziasis was not studied.

In view of the advantages in facility of administration and in reduction of trouble and expense which a satisfactory oral treatment for bilharziasis promises, it seemed to us that further investigations on the alleged therapeutic action of miracil D should be undertaken. Steps were therefore taken, beginning in March, 1947, to study miracil D further both in laboratory experiments and in clinical trials. In view of the interest shown in miracil D in recent months (Wood 1947, Latner et al. 1947, Blair et al. 1947), a preliminary account of our results may be of interest.

## LABORATORY EXPERIMENTS

The experiments on animals consisted in the oral administration of solutions of miracil D to mice, jerbils, and monkeys artificially infected with either *B. mansoni* or *B. hematobia*. In those animals to which a sufficient dosage was given for a long enough time—e.g., five doses (daily or on alternate days) of 40–50 mg. per kg. of body-weight—both viable ova and the symptoms of bilharziasis disappeared, and at necropsy either no trace of the parasites was discovered or at most dead and disintegrating worms were found. Control animals showed normal infestation. In mice and jerbils, however, in lower dosages (from four to six doses of 10–25 mg. per kg.) miracil D appeared to be erratic in its action, producing a complete cure in some of the animals in each treatment group, a partial cure in others, and failing to have any effect on the parasites at all in some. In doses of less than 10 mg. per kg. it appeared to be ineffective.

## CLINICAL TRIALS

In the clinical trials enteric-coated tablets of two sizes, one containing 200 mg. and the other 50 mg. of miracil D, were used. Since Kikuth and Gonnert had claimed that monkeys could be cured with two doses of 5 mg. per kg. of body-weight a preliminary series of twenty patients at the Fuad I Research Institute and Endemic Diseases Hospital were given two doses of 400 mg. at an interval of 3 days. All these patients were in fairly good general health: fourteen were suffering from *B. hematobia* infection alone, two with *B. mansoni* infection alone, and the remaining four from both forms of bilharzia. Since their average weight was low, each dose amounted to 7 to 10 mg. per kg. of body-weight. Patients remained under continuous post-treatment observation for 3 weeks and were then discharged and examined thereafter once a week for periods of 21 to 46 days. Since egg-counts from untreated patients showed considerable daily fluctuation, it is evident that conclusions based on examination once a week can only be regarded as tentative. However, the results obtained

\* The work outlined here was carried out in the Bilharzia Snail Destruction Section and in the Fuad I Research Institute and Endemic Diseases Hospital, Cairo, and in the Oosim District Hospital. Detailed accounts will be published as a special report from the Ministry of Public Health, Cairo, and as a paper in the *Transactions of the Royal Society of Tropical Medicine and Hygiene*.

gave us reason to hope that with higher and more frequent dosage a larger percentage of cures might be obtained. Apparent cures were obtained in seven out of twenty cases, but in the light of later experience it is possible that if a longer follow-up had been practicable relapse would have been detected. In subjects not under close supervision the value of a long follow-up is jeopardised by the possibility of reinfection. In two cases *B. haematobia* ova had disappeared from both urine and faeces by the 65th day after the end of treatment. In another case dead *B. haematobia* ova only were found in the urine from the 58th day onwards. In the four other cases *B. mansoni* ova disappeared from the faeces or were all degenerate, but viable *B. haematobia* ova were still found in the urine.

Another series of patients, consisting of agricultural workers from the village of Saqeel and workmen from the Bilharzia Snail Destruction Section, were at a later date treated with larger dosages. The villagers received four doses of 400 mg. on alternate days and were examined weekly thereafter. A second course of treatment consisting of 400 mg. daily for 5 days was given 7 weeks later. Before the second course of treatment only dead ova were being passed by three out of the four patients, and post-treatment examination after the second course revealed dead eggs alone in all four. Of the workmen, one received six doses of 400 mg. in 3 weeks, after which the ova disappeared from the urine. In three other cases the drug was given at the rate of 5 mg. per kg. of body-weight every 12 hours for a week in one case and a fortnight in the other two. Hæmaturia, in one case very severe, rapidly disappeared, and the urine became negative for ova about a week after the end of treatment. Hatching tests were consistently negative in all these cases. The patients showed a striking improvement in physical condition. Viable ova reappeared in the urine of two cases after 2 months, but this may have been due to reinfection.

A longer follow-up has been possible in a number of these cases. Of eight which appeared to be cured, seven have relapsed, and although a further course of treatment again produced a temporary disappearance of ova, the patients have not been completely freed of their parasites. In adults the number of eggs in the urine is negligible in comparison with those present before treatment. In children, probably because of the more rapid elimination of the drug, improvement is less marked. Hæmaturia and blood in the faeces have not reappeared in most treated cases.

Miraocil D was well tolerated on the whole, but in a few cases there was anorexia, sometimes accompanied by vomiting and abdominal pain. Transient vertigo and tinnitus was also observed in two cases.

#### DISCUSSION

These experimental and clinical results indicate that miracil D given by mouth in adequate doses has a considerable action in both urinary and intestinal bilharziasis. The erratic results observed with a low dosage appeared to be due to variation in the blood level, which has been shown by Wootton et al. (1947) to be correlated with the urea-clearance rate.

Dosages up to 600 mg. every 12 hours produced a substantial amelioration of the clinical symptoms; the number of ova in the urine and faeces decreased, and usually they disappeared for a time. Complete cures were, however, rarely attained, and after 3 to 8 weeks in most cases small numbers of ova reappeared, although generally symptoms remained absent.

It is possible that more intensive treatment designed to maintain an even higher blood level may be effective in producing complete cure with this drug. Whether or not this is achieved, the fact remains that miracil D is the first drug given by mouth which has shown signifi-

cant activity in the treatment of this disease, and it may prove to be the forerunner of others which will kill the parasites in man quickly, surely, and safely.

We wish to acknowledge our indebtedness to His Excellency Dr. A. T. Shousha Pasha, under-secretary of state for medical affairs, Ministry of Public Health, Cairo, for his unfailing help and encouragement throughout the course of this work and for permission to publish this preliminary account.

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## Reviews of Books

### The Child's Hearing for Speech

MARY D. SHERIDAN, M.A., M.D., D.C.H., L.R.A.M., assistant school medical officer for Manchester; lecturer in school hygiene, Mount Pleasant Training College, Liverpool. London: Methuen. 1948. Pp. 120. 10s. 6d.

SOME years ago Dr. Sheridan became interested in the question of speech and language, and especially the development of the actual sounds of speech. This is a problem of infancy and childhood, and a child whose linguistic development is delayed is at a disadvantage since a parallel is usually drawn between his ability to acquire speech and his mental capacity. Most children articulate with complete intelligibility by three years of age, and the articulation pattern (or accent) becomes identified with the environment by the age of five. Speech is acquired by trial and error, and accompanied by so keen a sense of satisfaction that repetitive imitation is induced until the habit is firmly contracted. This process of repetition involves auditory, visual, and kinæsthetic memory, of which the first is most important. Local accents are perpetuated in this way in colloquial speech, but in formal declamatory speech, such as reading aloud in class, colloquialisms are largely lost. This provides a method of distinguishing between degenerate speech and a true defect. The author has charted phonetically the speech defects she encountered in many years as a school medical officer, and has gathered much interesting information about hearing defects and the acquisition of speech. She suggests a number of improvements in the education of children with defective hearing.

### Microbial Antagonisms and Antibiotic Substances

(2nd ed.) SELMAN A. WAKSMAN, professor of microbiology, Rutgers University. New York: Commonwealth Fund. London: Oxford University Press. 1947. Pp. 415. 22s.

THE first edition of Professor Waksman's valuable book, which appeared three years ago, was welcomed especially for the broad background it gave to the discovery of penicillin. This new edition reviews our knowledge up to February, 1947. As before, there are chapters on the soil, the inter-relationships of micro-organisms, antagonisms exerted by bacteria, actinomycetes, and fungi, the chemical nature of antibiotic substances, the nature of antibiotic action, the use of antibiotics for chemotherapy, and the microbiological control of soil-borne plant diseases. Perhaps unavoidably, the relevant substances or organisms are considered in turn under each heading. But the antibiotics are a heterogeneous collection

of substances, including lipid-like bodies (pyocyanase), pigments (pyocyanin), polypeptides (gramicidin), sulphur-bearing compounds (penicillin), and quinones and organic bases (streptomycin), having no resemblance apart from their origin, and Professor Waksman's method of presentation, though it maintains a broad view and permits many interesting analogies and comparisons, makes it difficult for the reader to obtain complete information about any particular substance.

The chemical aspects of penicillin and other substances are described in outline, and so are the main principles in the chemotherapeutic use of penicillin, streptomycin, and tyrothricin; but the details of the clinical application of these substances are left to the special monographs produced by other workers. Though the author has made many eminent contributions to this field of knowledge, the book is a compilation rather than an expression of his own views and experience. A full bibliography will be useful to research-workers, and so will the tables of data about toxicity, antibacterial action, and similar subjects. Whereas in the first edition 34 antibiotic substances were mentioned as having been characterised and studied, the list now given contains over 80, though so far only 3 of these (penicillin, streptomycin, and tyrothricin) are used in practice.

#### Dermatoses among Gas and Tar Workers

WILLIAM DAVID JENKINS, B.A., M.R.C.S., chief medical officer, South Metropolitan and South Suburban Gas Companies. Bristol: J. Wright. 1948. Pp. 54. 25s.

THE late Dr. Jenkins was chief medical officer to the South Metropolitan Gas Company and one of the pioneers in industrial medicine. This monograph, the result of years of careful observation, was being prepared for publication before he died. To those who knew him his conclusions will carry great weight. Among other facts, he found that acute occupational dermatitis in his industry is uncommon, and when it does occur it is not more prevalent among workers in the retort houses than among machine operators. Thus tar itself is not a particular cause of acute dermatitis. He found that acne is not common among tar workers, thus dispelling an old fallacy. Warts and epitheliomata occur predominantly on the exposed areas and more often in tar and pitch workers than gas workers. He further noted that many so-called warts, on section, proved to be malignant. The book gives some sound advice on prevention and treatment, and is a valuable contribution to industrial medicine.

#### Uterine Contractility in Pregnancy

DOUGLAS P. MURPHY, M.D., F.A.C.S., assistant professor of obstetrics and gynecology, University of Pennsylvania. Philadelphia and London: J. B. Lippincott. 1947. Pp. 130. 30s.

THIS small book describes investigations into the behaviour of the pregnant and parturient uterus with a tocograph, which records the uterine contractions with a pen on graph-paper. The study includes the behaviour of the normal and the abnormal uterine action, and also the response of the uterus to various drugs such as pituitary extract and oestrogen. Uterine inertia, malpresentation, and the action of morphine on the uterus in labour are also discussed. The book is generously illustrated by the actual graphs obtained by Dr. Murphy, and these are particularly helpful in interpreting his results. Much of the work is relatively unknown in this country, and this concise publication will be useful not only to obstetricians but to any doctor who handles obstetric cases.

#### Transactions of the Fifth and Sixth Conferences on Liver Injury

Editor: Dr. F. W. HOFFBAUER. New York: Josiah Macy Jr. Foundation. 1947. Pp. 128 and 74. \$2.25 and \$2.

THE Macy Foundation renders a service in publishing reports of conferences by North American experts on live medical topics. Such reports reveal the salient unsettled points in research, and often include information otherwise unpublished. These volumes contain a full discussion of the dietetic production of liver damage, by Paul Gyorgy, J. L. Bollman, and H. P. Himsforth.

S. E. Bradley reports on studies on liver function by catheterisation of the hepatic vein, while C. J. Watson describes his extensive composite biochemical inquiries. Hepatic lesions in brucellosis are the subject of an interesting communication by W. W. Spink. A distinguished group of pathologists have tried to define the points on which Laennec's cirrhosis may be differentiated from post-necrotic scarring: the difficulties of histological recognition of these two groups are indicated by the fact that when sections were examined microscopically by eight pathologists of world-wide repute there was complete agreement in only 19 cases out of 106. Water retention in liver disease is discussed by D. H. Labby, and C. E. Dent gives an excellent account of the recognition of amino-acids in the urine in liver disease by means of chromatography.

**Diseases of the Eye** (11th ed. London: J. & A. Churchill. 1948. Pp. 732. 30s.).—Chemotherapy has meant a revolution in the treatment of eye conditions, as everywhere else. The new edition of this long-lived textbook (born 1907 and still going strong) brings the story up to date, and new conceptions in neurology and pathology have enforced changes in text and arrangement. With this edition Sir Stewart Duke-Elder joins Sir John Parsons, F.R.S., as co-author.

**Endotracheal Anæsthesia** (2nd ed. Wisconsin: University Press. 1948. Pp. 237. \$4).—Prof. Noel A. Gillespie's delightful little monograph first appeared some five years ago. With text revised and illustrations added it will undoubtedly continue to be a standard reference to every aspect of endotracheal anæsthesia. The language is clear, the discussion scholarly, and the scope comprehensive. As though this were not enough, there are numerous illustrations, each helpful to the text, and complete lists of references at the end of each chapter. Both the novice and expert will profit from it.

**British Encyclopædia of Medical Practice: Medical Progress and Cumulative Supplement, 1948** (London: Butterworth. Pp. 511 and 377. £2 7s. 6d.).—Lord Horder, editor-in-chief of these useful volumes, draws attention to the critical surveys of penicillin therapy and resistance, the toxic effects of streptomycin, surgical treatment of hypertension, modern management of placenta prævia, operative treatment of congenital heart disease, and advances in aviation medicine. The section on drugs and the abstracts of current literature appear as usual, and the cumulative supplement contains the regular quota of substantiated work.

**Gardiner's Handbook of Skin Diseases** (5th ed. Edinburgh: E. & S. Livingstone. 1948. Pp. 250. 15s.).—This small well-illustrated volume should prove useful to the student beginning his course in "skins." The material is presented concisely and dogmatically by Dr. John Kinnear, and the sections on treatment are singularly clear. It is not a bad thing for the student to be provided with basic information only in a given subject and then to have to build up his knowledge from practical experience. Dermatology is a confusing subject for the beginner, and an attempt to master one of the larger textbooks at the outset often adds to this confusion. This book, from the simplicity of its presentation and its freedom from complicated matter, should have a wide appeal.

**The Foot and Ankle** (3rd ed. London: H. Kimpton. 1947. Pp. 847. 55s.).—This new edition, almost 200 pages larger than its forerunner, is encyclopædic: the author, Prof. Philip Lewin, of Chicago, seems to have annotated all available papers dealing with diseases of the feet, and he gives full accounts of general diseases with foot and ankle manifestations. As a book of reference it is magnificent, but in spite of inset tabulated "don'ts and do's" the book misses fire as a students' manual. There are some curious omissions: for instance, among seven methods of treating erysipelas of the foot, penicillin and sulphonamide therapy are not mentioned, and the uninitiated would get the impression that injections of milk and antistreptococcal serum were our chief weapons of defence. Similarly there is little attempt to assess and criticise methods described. Despite these criticisms (which the book can easily stand) teachers of surgery will find its references useful, practising surgeons will value its detailed accounts of operation technique, and candidates for higher surgical degrees will enjoy the esoteric and comprehensive factual writing.

# THE LANCET

LONDON: SATURDAY, MAY 8, 1948

## Representation of Specialists

ONE of the effects of planning services on a national scale is to force their members into new complexities of organisation so that they can look after their legitimate interests. Hitherto there has been no body representative of all the consultants and specialists in the country, for there have been few questions needing their corporate consideration. The National Health Service Act, however, in setting up a service of consultants and specialists, has made it necessary to determine their qualifications, remuneration, and terms of service. These are matters which must be settled with a body that represents all consultants and specialists, since there must be consistency. As no such body exists the British Medical Association is seeking to fill the gap, and its council proposes to set up "Regional Consultants and Specialists (including Hospitals) Committees" and to establish a "Central Consultants and Specialists Standing Committee."<sup>1</sup> The number of members of the regional committee is not precisely laid down, but it is contemplated that it should consist of about 30 persons of whom not more than 5 should be past or present members of the staff of a teaching hospital. The composition of the Central Consultants and Specialists Committee designed to replace the present B.M.A. Consultants and Specialists and Hospitals Committees is more vague, but as the majority of this committee are to be elected by the regional committees it is doubtful whether the teaching hospitals would be more fully represented centrally than peripherally.

Before discussing the B.M.A. proposals further it will be well to consider the kind of questions concerning consultants and specialists to which the administrators of the National Health Service Act will want answers. In the first place, they will need to know who are to be regarded as consultants and specialists. (Not only will the criteria of qualification have to be determined, but these criteria will have to be applied in future to all who enter the service.) Closely allied to the question of qualification is that of remuneration. Here again some general principles will have to be established at the outset, and it is hoped that these will be made clear by the report of the Spens Committee. But if, as is probable, some graduation of remuneration, based on experience, is required, someone will have to decide in which category to place those individuals whose position on the scale is not automatically defined. These are questions of great importance to all who will work in this branch of the service. In addition there will be much day-to-day administrative work, which will call for an experienced permanent secretariat.

The arrangements at present proposed by the B.M.A. council do not seem to be what is needed. A central body elected by regional committees on

which the teaching hospital representatives constitute a small minority can have neither the experience nor the authority to determine the qualifications of consultants and specialists. Also there are other difficulties which it is wise to state frankly. Though the B.M.A. has of late years taken more interest than formerly in the activities of consultants, it remains predominantly the organisation of the general practitioner, who through sheer weight of numbers must chiefly influence its policy. The dominant part played by the B.M.A. during the latter part of the controversy over the National Health Service Act should not obscure the fact that in creating the Negotiating Committee it was felt necessary to provide representation for consultants and specialists independently of the B.M.A., and to set up a widely representative committee to advise the negotiators on matters relating to the specialist side of the service. And even substantial unanimity of the profession over this dispute was not sufficient, as later events showed, to make the consultants and specialists whole-heartedly accept the leadership of the B.M.A. It is conceivable that circumstances might arise in which the interests of the consultant and of the general practitioner would conflict, and inconvenience would then be caused if the affairs of consultants were managed by a committee of the B.M.A. reporting to a council containing a majority of general practitioners.

What alternative is there? The Royal Colleges will clearly have a highly important part to play; but they have not in the past had to concern themselves with the remuneration of their members, and it is questionable how far they should do so. Moreover there are specialties that do not fall within the scope of any of them, and the colleges have neither individually nor collectively the administrative staff necessary for the work likely to arise. The new conditions seem therefore to call for an entirely new organisation formed from representatives of the Royal Colleges and of the other associations of specialists. Such a Council of Consultants and Specialists would deal with questions of policy on the national scale. On questions involving the qualifications of specialists and their conditions of work it would consult the appropriate constituent body. Often this appropriate body would be one or other of the Royal Colleges; but by no means always. In psychiatry, for example, besides a small number of consultants who are fellows or members of the Royal College of Physicians there are many whose qualification is the D.P.M. Psychiatry presents special and complex problems of organisation which intimately concern the consultants and specialists in that field, and the same is true of other specialties such as radiology. The new council, with its own staff and independent organisation, would draw on the wisdom and long practical experience both of the Royal Colleges and of such bodies as the Royal Medico-Psychological Association and the Faculty of Radiologists. In so far as it relieved the colleges of an administrative burden it would leave them free for their main tasks of supervising medical education and examinations, fostering research, and above all maintaining the standard of consulting medicine. Mr. BEVAN is offering us plenty of new wine: let us not be afraid to make a new bottle.

1. *Brit. med. J.* suppl. April 10, p. 77.

## Anti-anæmic Substances from Liver

In the last few weeks important progress has been reported in the twenty years' search for the liver substance active in pernicious anæmia. By 1946 materials active in doses of only a few milligrammes had been obtained,<sup>1</sup> but their composition was not known with any certainty and they were still mixtures. The discovery of folic acid at first seemed to make further work on the purification of active liver factors unnecessary, except from the academic point of view. But two years' experience has proved that although folic acid strikingly improves the anæmia and transforms megaloblastic to normoblastic hæmopoiesis this improvement is often not maintained; moreover,<sup>2</sup> it does not benefit the accompanying lesions in the central nervous system and may even make them worse. As Dr. Wilkinson and Dr. Israël urge on page 727, folic acid is not suitable for the routine treatment of pernicious anæmia; and it cannot be the long-sought anti-anæmic liver principle.

Further steps in the separation of anti-anæmic materials from liver are therefore of practical importance, and two recent preliminary reports show that materials that are active in quantities measured in microgrammes have now been obtained. In the U.S.A., RICKES and colleagues<sup>3</sup> have obtained from liver a compound of high anti-anæmic activity that crystallises in the form of small red needles. Their fractionations were guided by the observation of MARY SHORB<sup>4</sup> that *Lactobacillus lactis* Dorner needs two hitherto unidentified growth factors, one of which appeared to be related to the anti-anæmic activity of liver extracts. The crystalline red needles obtained from purified liver fractions were found to be 11,000 to 17,000 times as active for supporting the growth of these bacteria as a standard liver concentrate used for the treatment of pernicious anæmia. This factor, which has been named "vitamin B<sub>12</sub>," was tested by WEST<sup>5</sup> on patients with pernicious anæmia in relapse, and the three case-reports show that a single intravenous dose of 150 µg. produced a reticulocyte response of 27%, a rise of red cells from 1,500,000 to 3,400,000 per c.mm. in 23 days, and a corresponding improvement in the hæmoglobin level. This dose was probably too large, since partial though definite responses were obtained with single doses of 6 µg. and 3 µg. It is therefore possible that the daily maintenance dose for the average pernicious-anæmia patient may be no more than 1 µg. of vitamin B<sub>12</sub>. The nature of this vitamin is not yet known and the American workers still cannot tell us its chemical composition, but such information is likely to follow soon. At almost the same time LESTER SMITH,<sup>6</sup> of Glaxo Laboratories, has reported the preparation from liver of two red pigments that are therapeutically active in pernicious anæmia in very small doses, though not quite so small as those of vitamin B<sub>12</sub>. SMITH used partition chromatography as an essential part of the separation process and he was guided by the observation that the intensity of the red colour and the anti-anæmic activity ran parallel. Only

very small amounts of this active pigment are present in liver—from 4 tons of liver about 1 g. of material was prepared. The most active material, named L.E.445, was obtained from proteolysed liver. In clinical tests Dr. C. C. UNGLEY found that the minimum effective dose in patients with relapsed pernicious anæmia was 600 to 300 µg. Electrophoretic studies showed that these pigments were still mixtures, and by further purification SMITH has prepared a pigment with 8 times the colour intensity of the original L.E.445; this has not yet been clinically tested but it should be still more active. SMITH can give more details of the chemistry of his pigments than are available about vitamin B<sub>12</sub>. They are amorphous solids with molecular weights of the order of 3000, various lots containing from 11.7% to 13.9% nitrogen. He thinks that the effective daily dose for pernicious anæmia may be only 20 µg. or even less.

These findings are extremely interesting and show that there is still hope of producing a relatively pure anti-anæmic substance that will not require assay by testing on pernicious-anæmia patients, with all the limitations that selection of suitable cases imposes. LESTER SMITH, however, goes on to make two surprising claims: first, that his pigments are "differing forms of the classical liver factor of MINOR and MURPHY and not some incomplete substitute such as folic acid or thymine"; and secondly, that his pigments will relieve the affection of the postero-lateral tracts of the spinal cord sometimes occurring in pernicious anæmia. The first claim is surely open to the criticism that his substances are not pure; and further, since colour intensity and clinical activity are linked in his preparations, it is difficult to explain the existence of completely colourless but still very active liver preparations. His second claim, for which the evidence will no doubt be given later, is likely to be received with even more reserve. Experience with folic acid has taught us to require a long period of observation to substantiate claims either that any material is a complete substitute for the usual liver extracts or that it will benefit the cord lesions. Signs of posterolateral tract sclerosis may develop after as long as 2 years on folic acid treatment. To confirm his claim, it would be reasonable to expect LESTER SMITH to produce unequivocal evidence of the reversal of positive signs of cord changes, and to show that patients treated with his pigments remained free of signs and symptoms for 18 months or more. RICKES and his co-workers merely claim that their material—which may be similar to LESTER SMITH's and has been carried to a higher degree of purity—is a crystalline compound with hæmopoietic activity. They adopted the unspecific name "vitamin B<sub>12</sub>" because "the biological rôle of this new compound in the treatment of pernicious anæmia and other disease is yet to be learned," and the activities of crude materials (even so active a material is still regarded by them as crude) have often proved to be due to several chemically related substances.

This standpoint of the American workers seems wise at this stage. From the published evidence it is still not certain whether the anti-pernicious-anæmia liver principle has been discovered, or whether these workers have isolated materials which, without

1. Leading article, *Lancet*, 1946, ii, 532.

2. Leading article, *Ibid.*, March 6, p. 371.

3. Rickes, E. L., Brink, N. G., Koniuszy, F. R., Wood, T. R., Folkers, K. *Science*, 1948, 107, 396.

4. Shorb, M. S. *Ibid.*, p. 397.

5. West, R. *Ibid.*, p. 398.

6. Smith, E. L. *Nature, Lond.* 1948, 161, 638.

being closely related to the principle itself, will more or less completely set the hæmopoietic system in order. The action of stilbæstrol and its variants in reproducing the action of natural oestrogens is an example of such a system. Confusing claims, however, need not blind us to the fact that a big step forward has been taken. We must wait patiently for more information about the nature of these substances and for the results of the lengthy clinical trial necessary to establish their therapeutic value.

## A Population Policy?

FOUR years ago the Coalition Government, concerned about the low level of the birth-rate and the trend towards an ageing and declining population, appointed a Royal Commission to investigate and recommend. It is always easy to make fun of ageing Royal Commissions, but this one has had a peculiarly hard time. Sixty years of falling birth-rates had stimulated discussion and alarm among demographers and economists, but there was no general public clamour for a Royal Commission. This was not surprising, for memories of undignified and demoralising unemployment—of too many rather than too few people—had not been extinguished by the exceptional demands of another war. It would be truer to say that the current of social inquiry and reform, swollen by the storms of war from a meandering stream to an angry river, was chiefly responsible for the appointment of this commission. Moreover, in the course of its deliberations, the birth-rate impishly and awkwardly rose to a relatively high level, thus leading many people to second thoughts on the subject. The commission has had to do its thinking in a period when the number of births has been larger than at any time for over twenty years; yet now, as it nears the end of its labours, the birth-rate once more points downwards in no uncertain manner. More important and more difficult still, economic developments of a global character, which had for a decade or two been undermining Britain's traditional position in the scheme of things, were fully exposed by the dollar crisis of 1947. Confronted with the battle for exports and economic survival, the Royal Commission will not find it easy to frame convincing policies in aid of larger families.

These factors, too, have affected P.E.P., which after several years' fact-gathering has now published a big and comprehensive book on population policy.<sup>1</sup> This report has much to say on many things of material value: it discusses, sometimes a trifle superficially, such diverse questions as abortion, mental defectives, homeless children, the treatment of sterility, housing policy, postnatal examinations, education for parenthood, preventable death, and a whole host of contemporary social issues. It asks for a positive population policy because it regards the recent rise in the birth-rate as a temporary phenomenon, and it parades many of the now recognised reforms to assist the building of family life—e.g., better and bigger houses, more home helps, arrangements for family holidays, greater opportunities for higher education, and improved health and social

services. Other specific recommendations which it advances include the raising of family allowances from 5s. to 10s. a week and of the maternity grant for first babies from £4 to £15, and the provision of marriage guidance and premarital medical examination. These and other proposals involving expenditure or income redistribution (such as higher tax rebates) are, however, qualified with a note of warning. Their introduction must depend, P.E.P. says, on the rate of general economic recovery. "Present economic conditions are not favourable to systematic redistribution of income according to family size; in the near future such a policy might do more harm than good." But here the report fails to appreciate that a redistribution is already taking place to the disadvantage of many parents with children. And, apart from its recommendation for a doubling of the family allowance, it also fails to distinguish sharply enough between economic measures designed to protect the standard of life of existing families and measures aimed at stimulating parents to increase their families.

The extent to which parents are carrying a proportionately heavier economic burden than single people or childless couples may be illustrated by comparing the incidence of direct taxation on these groups. With a total income of £500 a year, a man and wife who are both earning will pay, in 1948-49, £25 10s. in tax. With two children and the wife not earning, the tax will be nearly the same—namely, £22. At an income level of £1000 a year the childless couple (both earning) will pay £184 10s., and if the wife's contribution reaches £400 a year the tax will fall to £145 10s. But if the wife is not earning and there are two children to be fed, sheltered, and educated, £180 will have to be found; and if there are three children, £153. By comparison, the single person is in a fortunate state, for he or she will only have to pay £265 in tax and possibly nothing in local rates. These disparities between those with and without children were not so remarkable before the war. Likewise among people below the taxation line several important developments in recent years have tended to worsen the position of those with children relative to those without. For example, the adoption in 1947 of a new cost-of-living index gave much less weight to the cost of food and clothing, and much more to expenditure on drink and tobacco, amenities, and various miscellaneous items of a semi-luxury character.<sup>2</sup> The effect is to make the index less sensitive to rises (or falls) in the cost of food and clothing; it thus becomes less a "family index" and more a "single person index." Again, the introduction in 1945 of a new code of pay for men in the Armed Forces, based on the so-called "industrial principle" and thereby eliminating family allowances, places the man with children in a relatively worse position.<sup>3</sup> In the face of these apparently developing tendencies it is somewhat disingenuous to lay stress on the need for larger families, and to advocate a State-financed marriage-guidance service so as to give "the opportunity for normal married couples and those about to be married to talk over the manifold implications, economic, social, and psycho-

1. *Population Policy in Great Britain*. From *Political and Economic Planning*, 16, Queen Anne's Gate, London, S.W.1. 1948. Pp. 227. 15s.

2. *Ministry of Labour Gazette*, August, 1947.

3. *Post-war Code of Pay, Allowances, and Service Pensions*. Cmd. 6715. December, 1945.

logical, implicit in fixing the size of the family." Surely we can with equanimity and with economy leave young couples to decide, not in advance but as they go along, how many children they want. It is far more important to see that those who decide in favour of children are not, relatively speaking, so much worse off in material things compared with their friends and neighbours who remain childless.

For some years to come the major problem of family economics will revolve round the need for greater production (and therefore more women in factories, shops, and offices) as against the need for a steady supply of babies to prevent a future decline in the total population and a worsening in the balance of youth and old age. It is a pity, therefore, that this otherwise valuable report from P.E.P. fails to face this issue in a realistic and forthright manner.

### The Plebiscite

THE results of the plebiscite, analysed by groups, will be found in detail on another page. Of the doctors who returned their forms by last Monday 14,620 (36%) approve of the National Health Service Act "in view of the modifications now proposed by the Government," while 25,842 (64%) disapprove. Historians will note that the profession has deliberately recorded its opposition to the new measure. On the practical question whether service under the Act should be accepted, the voting among those chiefly affected is nearly equal, 12,799 (48%) being in favour and 13,891 (52%) against. The number of general practitioners and assistants who are against service is 9588 (compared with 17,037 in the previous plebiscite), and is thus several thousand short of the figure of approximately 13,000 which the British Medical Association council formerly thought necessary for effective opposition. It is true that 11,885 principals and assistants express their willingness to abide by the decision of a sufficient majority; but the majority, by previous definition, is insufficient. The B.M.A. council has the satisfaction of seeing its slightly negative lead translated faithfully into a slightly negative vote, but organised resistance to the Act seems to be no longer possible. We earnestly hope that the profession will adopt the only sane alternative—an organised effort to make it work. Those who are not actively against the service must in the end be actively for it, and the sooner this is recognised the better. Long hesitation followed by vigorous action is, after all, in the best English tradition, well illustrated in the late war. Writing of the preparations for the invasion of France in 1944, an American staff officer has described how during many disheartening months his British counterparts seemed to see nothing but obstacles. But when the final decision was reached their attitude changed overnight; their whole mind was now set on success for the plan adopted, and difficulties became incidental.

Nobody at all can be satisfied with a verdict so evenly divided, and the objections of the majority can be dispelled only by active co-operation in the new atmosphere created by the Minister's statement on April 7. As future partners in what is, after all, a great if rather hazardous enterprise, our representatives can work with the Minister on a new footing, and by friendly discussion of certain important details much can be done to restore confidence before the appointed day.

## Annotations

### THE M.R.C. IN WAR

DURING the last century medical science has earned a responsible place in national affairs; and this has never been more evident than in the late war, when it fell to doctors not only to treat the sick and wounded but also to promote the efficiency of the fighting Forces and the civilians who sustained them, and to maintain the population in full health. In this work the Medical Research Council played its part by advice to Government departments and the Services, by research into problems of immediate importance, and by devising and administering emergency services; and the M.R.C.'s own account<sup>1</sup> reminds us how well these duties were discharged.

From the start the prevention of undernutrition was recognised as the keystone to the structure of national defence; and perhaps the most important result of expert medical guidance was the continuance, despite attenuated supplies, of the people's capacity to work and fight. Much of the council's advisory work consisted in drawing attention to earlier investigations which had passed unnoticed; and the report observes that with proper appreciation of previous studies of vocational selection and accident-proneness "it might have been possible to avoid the introduction of those excessively strenuous working conditions in the period immediately following the evacuation of Dunkirk which proved incompatible with a large sustained output from the factories and with a good standard of health among the workpeople." Personnel research committees, representing the new and active rôle of medicine in war, were formed and attached to each of the three Service departments. Engaged largely in environmental research, they aimed to fit the machine to man rather than man to the machine. Their experience can well be turned to peaceful purposes; and the report expresses the hope that whenever in the future new problems "involving the design and development of instruments, weapons and machinery, which have to be worked by human beings, arise, it will no longer be thought sufficient to have such matters considered only by engineers and physicists."

The council was largely concerned with the risk of infectious diseases; and this was one of the principal considerations leading to the establishment of the Emergency Public Health Laboratory Service. For the protection of Service people new vaccines and inocula, new drugs, and particularly new chemotherapeutic agents were devised. These agents had an important influence on war surgery; thanks to them and the surgical methods that they made possible, of the British soldiers who came into the hands of the medical service after being wounded in the north-west Europe campaign of 1944-45 only 7% died. On the whole, surgical advances were less notable in technique, which had been explored in the earlier war, than in the vital ancillaries—anaesthesia, the prevention and treatment of shock and of infection, and reablement. One effect of these improvements was to give greater latitude to the operator, especially in plastic surgery and the surgery of head and chest.

The common need and the pall of "security" which descended even on medical research drew the workers of the Allied nations together; and many of the advances derived from integrated international effort. The fruits of war-time research were won by concentration of resources on immediate problems and by reduction of the time-lag between discovery and application. Many of the ad-hoc studies were based on fundamental investigations undertaken in the measured tempo of

1. *Medical Research in War: Report of the Medical Research Council for the Years 1939-45.* Cmd. 7335. H.M. Stationery Office. Pp. 455. 7s. 6d.



peace; and by 1945 this source was running dry. The report says:

"There comes a time when the research worker has to decide whether to confine his interests to giving limited answers or to delve deeper, and inevitably more slowly, to obtain a fuller grasp of the principles involved. So it is that, although war acts at first as an intense stimulus to certain branches of medical research, in the long run it tends to lose its effect as an incentive to discovery."

Between 1940 and 1945 the grants-in-aid made by Parliament to the council grew from £195,000 to £295,000 a year. Was ever money better spent?

### HUMANITY IN HOSPITALS

Dr. S. S. Goldwater died in 1942, revered by the American hospital world. He went to work in his early teens, but later returned to school and to the universities of Columbia and Leipzig, where he studied economics, philosophy, and ethics. He then recognised his passion for improvement in the order of society, and decided that medicine would afford him the solid ground for an approach to a better world. Graduating from New York University College of Medicine in 1901, he soon had to face the choice between clinical medicine and administration. His imagination was captured by the hospital as an institution, "a strange, fascinating, forbidding mixture of elevating and depressing elements"; but little prestige then attached to the position of hospital superintendent, and his fellow interns were surprised when Goldwater applied for the position of assistant superintendent then vacant. Thenceforward he became identified with the Mount Sinai Hospital, of which he was administrator from 1902 to 1929, later filling other prominent posts in the hospital world of New York. In 1908 he was chosen president of the American Hospital Association, for his advice was already being widely sought. He was consulted by Chicago on a plan for a hospital of 4000 beds, and succeeded in arousing the leading citizens to the enormity of "five or six miles of sick beds under one management, an ungovernable mass which spells outrage and disaster." A little later at Philadelphia, plans for a great conglomeration of poor-house, home for the aged, orphanage, insane asylum, hospital and what not were referred to him, and Goldwater "with all the courtesy in the world cast the plans into the rubbish heap." His later life was an unending round of consultation, and advice given in many directions.

A brief account of Goldwater's life and a selection of his writings<sup>1</sup> affords a running commentary on the great creative period of American hospitals in the first three decades of the present century. He was always suspicious of the tendency to increase the size of the institution, and the reader will wonder how he would have viewed the present tendency in Britain to entrust several hospitals to the control of a single hospital management committee:

"In cities of moderate size," he said, "consolidated management seems to be the simplest method of handling the matter. In very large communities, however, the management of many large institutions from a central office may result disastrously, unless each institution belonging to the system is granted a large measure of local autonomy with respect to its internal affairs. The problem here is the familiar one of maintenance of the individuality of an institution, stimulation of local pride, encouragement of healthy rivalry, development of a keen sense of responsibility, and especially the fostering of warm personal devotion, without which the morale of an institution is speedily impaired. . . . The duplication of medically efficient and physically economical units is perfectly sound practice, and should not be discouraged by central hospital authorities."

He was a vigorous advocate of training in hospital administration: "what the hospitals ask for is a superintendent who will see that the policies of the trustees

are carried out, and that established rules and regulations are enforced; what the hospitals need is an executive capable of initiating measures to fit the hospitals' program accurately to the needs of the community." A trained superintendent, yes: but absolute hierarchy, certainly not. A quotation from Florence Nightingale's *Notes on Hospitals* is invoked:

"In our imperfect state of conscience and enlightenment, publicity, and the collision resulting from publicity, are the best guardians of the interests of the sick. A patient is much better cared for in an institution where there is the perpetual rub between doctors and nurses, between students, matrons, governors, treasurers, and casual visitors, between secular and spiritual authorities, than in a hospital under the best governed order in existence, where the chief of that order, be it male or female, is also chief of the hospital. Taking the imperfect general run of human things, for we are considering men and not angels, public opinion is a higher average standard than individual opinion."

Goldwater thought *Notes on Hospitals* a document that every student of hospitals should read at least once a year—"for boldness of aim, warmth of expression, and breadth of view, it has no equal in hospital literature." Though his copious essays do not lend themselves to summary, these few quotations may suffice to show the stature of one of the men responsible for making the American hospital world the living thing that it is today.

### DIAGNOSIS OF DISSECTING ANEURYSM

DISSECTING aneurysms of the aorta are most often diagnosed on the post-mortem table, but, though they are much rarer than cerebrovascular accidents or myocardial infarction as a cause of sudden collapse or coma, there is now sufficient evidence for a diagnosis to be possible during life. Of the 44 cases reviewed by Baer and Goldburgh,<sup>1</sup> 11 were diagnosed before death. The recorded incidence varies, according to the source of the information. Thus, in medicolegal reports on sudden deaths an incidence of 1.1% has been recorded,<sup>2</sup> whereas in general necropsies the incidence ranges from 1 in 480<sup>3</sup> to 1 in 431.<sup>4</sup> It is predominantly a condition of middle-aged or elderly men. In his classical monograph Shennan<sup>5</sup> noted that over 80% of cases occurred over the age of fifty years, with 65% in men. Baer and Goldburgh give similar figures—76.5% over fifty and 66% males.

The typical picture closely resembles coronary thrombosis, with sudden severe pain and intense dyspnoea, but in 24 of the 44 cases collected by Baer and Goldburgh there was no record of pain throughout the patient's illness. If the patient survives the immediate rupture the most common signs are pyrexia, tachycardia, and dyspnoea, often with a polymorph leucocytosis, all of which will fit in with the commonly made diagnosis of myocardial infarction or an acute abdominal catastrophe. As a rule the pain is mainly epigastric, and it may even be accompanied by hæmatemesis or melæna if the gastric or mesenteric vessels are involved, but there is usually no history suggestive of peptic ulcer or carcinoma of the stomach. The electrocardiogram is not characteristic, though in view of the age-incidence there may well be changes pointing to coronary disease. A hæmorrhagic hydrothorax should raise suspicions of dissecting aneurysm. Hypertension is present in most cases, but a temporary fall in pressure is usual at the time of the catastrophe. An aortic diastolic murmur appears in a minority of cases, and the development of cardiac or aortic enlargement is a useful diagnostic finding in patients who survive. Bizarre neurological signs, presumably due to involvement of the intercostal, lumbar, or femoral

1. Baer, S., Goldburgh, H. L. *Amer. Heart J.* 1948, 35, 198.

2. Mote, C. D., Carr, J. L. *Ibid.*, 1942, 24, 65.

3. Gouley, B. A., Anderson, E. *Ann. Intern. Med.* 1940, 14, 973.

4. Glendy, R. E., Castleman, B., White, P. D. *Amer. Heart J.* 1937, 13, 129.

5. Shennan, T. *Dissecting Aneurysms. Spec. Rep. Ser. med. Res. Coun., Lond.* no. 193, 1934. See *Lancet*, 1934, 1, 470.

1. *On Hospitals.* By S. S. GOLDWATER, M.D. New York and London: Macmillan. 1947. Pp. 396. 45s.

arteries, are sometimes found in the lower limbs, or involvement of an anterior spinal artery may cause a sudden painless paraplegia. In other cases the dissection produces a periarterial sympathectomy.

According to Weiss,<sup>6</sup> in 1 out of 10 cases the dissecting aneurysm will heal, so it is worth while making a careful attempt to diagnose the cases which do not run a rapidly fatal course.

#### OUR FUTURE DIET

THE Chancellor of the Exchequer has made it tolerably clear that our prospects under the Marshall plan will leave the pattern of our daily diet more or less what it is, and that for an indeterminate time to come. The memorandum of the Central Council for Health Education, published on p. 723, assumes that we shall finally be able to procure and to eat the foods we like. But for the purposes of public education the distinction is of no great moment. What matters is that people should come to know the meaning of, and to prefer, a well-balanced diet. The family diet pattern of a skilled worker was no doubt less attractive in 1947 than it had been in 1937; but it was possibly far better balanced. To preserve and develop that element of balance, whether in conditions of austerity or of abundance, is the task of the teacher and the shaper of public opinion.

The authors of the memorandum show some appreciation, as well they may, of the diverse influences that have to act upon and within a community before it will consent to change its habits of life and especially its habits of eating. They want to make the natural educators of public opinion conscious of themselves as members of a vast team, working towards a common end. Reduced to its simplest elements, wherein lies the problem of our national diet? The answer given in the memorandum cannot itself be answered; but it is bound to raise in the medical mind a number of subsidiary questions; and it is as well to mention a few of these at an early stage in the discussions that will follow. For, while we must needs wait in some instances upon the slow process of research, and must in the meanwhile make practical use of what we already know, the direction of basic research is something on which the medical man has a right to express his views.

It is, for example, generally believed that we were on an average eating too much sugar before the war; and a reduction of about 17% has elsewhere been suggested as reasonable. Now, this may be true; but it is time that the facts on which the belief is based were plainly set forth. The authors of the memorandum say that a considerable quantity of the pre-war sugar was consumed in relation with refined flour products; and no doubt cakes, biscuits, and bread and jam made up a disproportionate part of the diet of many of us, not merely of the children of the low-paid workers. What we want to know is how far the intake of so large an amount of carbohydrate would be safe if all the flour used were of an 85% extraction.

A significant part of the work of the tissues is taken up in the process of carbohydrate metabolism; and it may be true that for carbohydrate metabolism we need at least some, and possibly most, of the vitamins of the B complex. In what proportion we need them may still be a matter of doubt; but so far as we need them, the case for a lightly milled flour seems now well established. If, as some have maintained, our greatest nutritional gain in the war was the 85% extraction flour, the principle is too important to be left to surmise. The doctor needs to have the evidence for such a conclusion clearly laid before him.

Lastly, while we are dealing with the implications of a well-balanced diet, what are we now to think of the value of ascorbic acid? Rather, since it is better to estimate in terms of the foods as consumed,

what are we to think of the value of fruit and vegetables? Recent investigations have seemed to suggest that a relatively low intake of ascorbic acid would be sufficient to keep a man on the safe side of scurvy. The requirements may vary from individual to individual; and it is probably wise to allow a margin. But between the consumption of vegetables sufficient to prevent scurvy and the high consumption of the convinced salad-eater and fruitarian lies a wide field open to exploration. Unless we know something of this field, we have no clear warrant for recommending as insistently as we do a higher and yet higher consumption of vegetables. For all that, most of us have a vague impression that somewhere within this field (and possibly the same applies to meat and other protein foods) lies the difference between the mere avoidance of deficiency and the state of well-being for which we are aiming.

What we have said must not be taken as criticism of the memorandum, but rather as evidence of its provocative character. The doctor has often owned his debt to the biochemist; and it is well to remember that the biochemist also needs to give ear to the doctor, when the latter expresses his doubts and his misgivings. Some of the recent controversies on the state of our national post-war diet have sprung, in reality, from the doctor's instinct that there are paths of nutritional research that have been unduly neglected because they are difficult to pursue.

#### SORRY NO BEDS

THOUGH everyone knows that it is often difficult to get an emergency case into hospital, few attempts have been made to measure the extent of this difficulty. Accordingly, the cases dealt with by the King's Fund Emergency Bed Service from June to November of last year have been analysed by the Nunfield Bureau of Health and Sickness Records at Oxford. In considering the results it must be remembered that those recorded represent an unknown proportion of all urgent cases admitted to London voluntary and county hospitals, and that the information about bed occupancy which is supplied by voluntary hospitals to the service gives it an advantage over the private doctor. The figures relate to a time of year when the pressure on hospitals is not particularly acute.

What one may call the coefficient of difficulty has been arrived at quite simply by finding the average number of hospitals asked to accept each case: no account is taken of such aggravating factors as the hospital's delay in reaching a decision. It appears that (against an ideal coefficient of 1.0) the actual coefficient for all types of cases in the latter part of 1947 was 2.7; whereas similar calculations for the year ending June, 1939, gave a figure of 1.6. There are, however, great variations between different specialties. Gynaecology is the blackest spot, with a coefficient of 4.4, largely due to the difficulty of getting any hospital to admit an abortion. (Indeed this figure would be worse if a small number of cases which were never admitted, even after trying 25 hospitals, had been included.) Maternity, on the other hand, was comparatively easy at 2.1—these cases being emergencies not in the sense of presenting medical difficulty but because the patient is in labour and has nowhere to go. Of medical patients women, with a coefficient of 3.0, are noticeably in worse case than men at 2.4; infants are easiest at 1.5, and children come out at 2.5, females being easier than males. In surgical cases the difficulty is much the same for all, at about 2.5. Geographically the obvious movement from the suburbs to the centre is clearly shown; but the influx is not the same from all points of the compass, those coming in from the north-west suburbs being eight times as numerous as those from the south-west suburbs. The reasons for this are many, including the fact that more voluntary-hospital beds are easily accessible to the north-west area, and these

6. Weiss, S. *Med. Clin. N. Amer.* 1935, 18, 1117.

are the only beds to which a patient can go if not admitted within his own county.

As already remarked, these figures are a special sample. But they do at least show that it was a great deal harder to get a patient into hospital in 1947 than in 1939. What of the future?

### THE NURSE'S JOB

COMMENTING on the report of the Working Party on the Recruitment and Training of Nurses, the Nuffield Provincial Hospitals Trust said:

"Long-term policy cannot be suitably framed or directed until an answer can be given to the fundamental question 'What is the proper task of a nurse?' To obtain the necessary data for this definition a complete job-analysis of the work of the nurse and the other members of the health team should be undertaken forthwith."

The trust now announces that it is undertaking this job-analysis, and has appointed Mr. H. A. Goddard to direct it. The new survey will cover the work and duties of the whole health team in hospitals, including auxiliary and domestic staffs, but attention will be concentrated mainly on the nurse. It is estimated that this country urgently needs another 30,000 nurses; but even if these could be recruited it would still be necessary to ensure that the best possible use was made of their labours. The Nuffield Trust will try to find out whether the nurse's energies are dissipated on time-wasting tasks that should not be hers, whether her efficiency is impaired by excessive hours of duty, whether her health is sufficiently guarded, and whether the atmosphere of her life is clouded by out-of-date ideas of discipline. A pilot survey in a hospital of medium size will shortly be made, and afterwards the inquiry will extend to hospitals of every type throughout the country.

### PSYCHIATRY FOR CRIMINALS

WHEN it comes to psychiatric examination, criminals find themselves in the same position as difficult children: somebody who is not a psychiatrist has to take the initial step of deciding whether they need to be examined by a psychiatrist. In the case of school-children, the parents, the teacher, and the school medical officer somehow or other make the necessary move. With criminals it could well be the prison medical officer, the magistrate, and the probation officer, in whatever combination or order the situation suggests. It would be impracticable to have all criminals psychiatrically examined, because of the shortage of psychiatrists; and indeed—unless in the case of small groups, in the interests of research—it might well be futile and wasteful to examine all types of them.

There are several directions in which psychiatric work for criminals could usefully be extended. At present prison doctors get little specialist training in this aspect of their work, and it might well be increased. At the same time all psychiatrists, during their 2½-3 years' basic training, should get some experience of the psychiatric aspects of crime, with appropriate clinical and theoretical instruction; and some of them should be encouraged to specialise in criminal psychiatry—or the psychiatric aspects of criminology—so that they could give expert advice on diagnosis, and treat suitable criminals, whether juvenile or adult. (This could hardly be achieved without the creation of a criminological department in some university school of psychiatry.) Finally, magistrates and probation officers should be given well-informed instruction in recognising the problems that call for psychiatric advice; and this too could best be given through a university school.

It is interesting in this connexion that the Criminal Justice Bill provides that—subject to the offender's consent—the requirement of mental treatment can be included in a probation order. Mrs. Craig, a magistrate, in a letter to the *Times* of April 6, regretted that such

treatment was made a condition of the order rather than a service connected with it, since the alternative to acceptance, she suggests, is a sentence. Consent in such circumstances can hardly be free. "Moreover," she goes on, "when this order has been made, the probationer is denied the right to apply for its cancellation or amendment, although with other conditions of a probation order the probationer has this right." She feels that in the best interests of treatment there should be co-operation, not compulsion; and that personality plays so big a part in psychiatric treatment that no doctor can hope to suit every case. All this is no doubt true. On the other hand, what seems chiefly important is that the court shall be able to ensure that delinquents who are suitable for treatment get it, even at the expense of some limitation in choice of doctor. The Bill provides that a court shall not make a probation order in the case of an offender over the age of 14 unless he consents to comply with the requirements of the order—which includes, of course, any requirement relating to mental treatment. The offender also has power to call rebutting evidence, and the right of appeal to quarter sessions against the order. It will be well not to let a relatively minor point obscure the good promised by these clauses of the Bill.

### THE CHILD WITH BAD SIGHT

LIKE partial deafness, poor sight in a child may long escape notice. The child himself does not know that he sees badly: he has no way of checking his vision, and supposes if the world looks like that, that must be how it looks. Mrs. Philippa Martin<sup>1</sup> points out that such a child cannot compete on equal terms with his companions; and the disappointment this brings to him and his parents has results which give no hint at the cause. Boys often become bad-tempered and rebellious, girls unhappy and inclined to escape into a close friendship with another girl. Discord at home mounts until someone suggests that the child should have his eyes tested. Those with myopia or a high degree of astigmatism, or a combination of the two, suffer most. The myope with vision of less than 6/60 cannot recognise friends across the street, and so gets a reputation for bad manners. Glasses may make all the difference to a child at school: for the first time he sees the blackboard clearly, and his work shows an immediate improvement. The type of mother who cannot bear the thought of her child in glasses is a menace.

Errors of refraction often cause headache, even in young children; and at any age headache after going to the cinema should suggest astigmatism. Red eyelids, repeated styes, and habitual blinking should also lead to an examination. Astigmatism often slows the child's work down and makes him disinclined for study. Hypermetropia may cause fatigue in the examination season, for the effort to accommodate for long periods of study may lead to blurring of vision. There is nothing for it, then, but to break off work and rest the fatigued ciliary muscle; but the best way to combat the difficulty is to provide the child or young adult with suitable glasses before intensive study for examinations becomes necessary. When the vision of the two eyes is uneven the child may need to wear an occluder for part of the time. This is such an embarrassing thing to do that Mrs. Martin feels it should rarely be advised for the child over 7. She thinks that if defects of vision are to be detected, all children should be "refracted" at 7, and refraction should be repeated at least twice more during the school career even though the first examination is normal. The squinting child must be treated over many years—by glasses and occlusion until the child is about 4 years old, when orthoptic treatment can begin. If an operation proves necessary, it is best undertaken at 7 or 8, before school life starts in earnest.

1. *J. med. Women's Fed.* April, 1948, p. 11.

## Special Articles

## BEDS FOR TUBERCULOSIS

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It has been stated recently by Dr. Heaf<sup>1</sup> that nearly 8000 patients are waiting to get into sanatoria while over 4000 approved beds for the treatment of tuberculosis are out of commission mainly through lack of nursing and domestic staff. Discussing remedies for this grave situation, he made a powerful plea for the better classification and distribution of different types of case and greater caution in the use of thoracic surgery in the "bad risk" patients. This advice should be acted upon, but is there anything more that could be done? I believe that an important part of the remedy lies in another direction.

While every effort should be made to stimulate an inflow of nurses into tuberculosis work it would be well to proceed on the assumption that greater numbers will not be forthcoming for several years ahead. Can we then make better use of the limited available staffs? Recent visits paid to the Swiss sanatoria impel me to think that the answer to this important question is "Yes."

Among many stimulating impressions derived from visits to a dozen different sanatoria, both private and cantonal, at Davos, Leysin, and Montana, the most remarkable was the ability of the Swiss sanatoria to carry on with an astonishingly low nursing ratio. In England and Wales the ratio of total nursing staff to occupied beds in tuberculosis hospitals and sanatoria is 21.9 to 100. This means that some institutions have 30 or more units of nursing staff to 100 patients. Nowhere in Switzerland (excluding a famous private surgical clinic) did I find more than 10 nurses to 100 patients. One medical director of a modern cantonal sanatorium told me proudly that they were well off for nurses, since they had 11 nurses for 120 patients! And this particular institution undertook a good deal of operative work for other clinics. At the other end of the scale the medical director of a first-class sanatorium, run by an insurance society, and undertaking collapse therapy in 82% of patients, told me that there was only 1 nurse to look after a floor of 30 patients. There would of course also have been a theatre sister and a sister superior, and possibly a few nursing aids. In this instance I did not take careful particulars, but there is no doubt that they carry on with a nursing personnel which is astonishingly small.

My notes show that in some other cantonal sanatoria the figures were 9 nurses to 100 patients, 8 to 140, 18 to 180 (where 70% of patients were undergoing collapse therapy); while in 4 of the best-known private sanatoria at Davos and Leysin the figures were given to me as 8 nurses for 130 patients, 10 to 100, 6 to 95, 8 to 130. I was interested to find a similar picture in two large children's sanatoria; but I exclude them from consideration here because they present a more complicated problem: they have to cover the needs of tiny children and adolescents and a wide variety of clinical conditions varying from suspected tuberculosis in the apparently healthy, through varying degrees of primary infection up to frank adult-type tuberculosis.

## METHODS IN SWITZERLAND

How do the Swiss manage to run their sanatoria with, to us, so alarmingly few nurses? One obvious reason is that the Swiss nurse works much longer hours. One medical director told me that he tried not to let his nurses work more than a 60-hour week! It was abundantly clear that a 12-hour day was the rule rather than

the exception. But this, of course, cannot be the whole story—the discrepancies between our nursing numbers and theirs are far too great to be accounted for so simply. However hard the Swiss nurses work they cannot possibly get through all the duties our very much larger staffs are responsible for. What then is the answer? Every holiday-maker in Switzerland knows what a clean country this is, and it is fortunate this is so; for the patients who are confined to bed cannot possibly get bathed as often as ours do in England. But the remarkable thing is that few are really completely confined to bed: and this is the major factor which enables the Swiss nurses to look after anything from 2 to 4 times as many tuberculosis patients as their English colleagues.

In the course of my visits as this fact became obvious I made fairly detailed inquiries about it and since returning have made comparable inquiries from three of our own tuberculosis institutions. The information thus collected need only be looked upon as a pilot investigation, but I feel there may be sufficient here to warrant a detailed inquiry by an experienced nursing and medical officer.

The following are some of my notes from the Swiss visits:

*Cantonal sanatorium.*—Patients are got out of bed very quickly and go to toilet and meals as soon as possible. This is considered to be beneficial both physically and psychologically.

*First-class private sanatorium.*—After a few days thoracoplasties get up for lavatory and to wash, provided they are well enough; obviously very little bed bathing.

*Public sanatorium owned by insurance society.*—The great majority of patients are undergoing some form of collapse therapy. A.P. patients are in bed for a month, but the day after induction get out to wash and go to lavatory; so do those who have had adhesions divided. Thoracoplasty patients get out to wash and go to lavatory after 5 days but otherwise are kept in bed for 2-3 months.

*First-class private sanatorium.*—Thoracoplasty patients get up after 2-3 days and go out for walks after a fortnight.

*First-class private sanatorium.*—Thoracoplasty patients up in 7 days.

*Cantonal sanatorium.*—A.P. patients and adhesion-section patients get up to wash and go to lavatory the following day; thoracoplasty patients get up for these purposes after a few days.

*Cantonal sanatorium.*—A.P. patients walk down to theatre for induction and walk back; always go to toilet and wash. Adhesion-section patients go out to lavatory and to wash the next day. Thoracoplasty patients are allowed up to lavatory and to wash in 5-10 days. In general all pulmonary patients get up to wash and to lavatory unless desperately ill.

I have no accurate details about the numbers of patients who get up for meals but the majority do so and this is implicit in the régimes outlined above.

It is not necessary for me to detail the differences in methods over here; they are sufficiently well known. I will only mention for comparison that the medical superintendent of a municipal tuberculosis hospital recently told me that 80% of his patients had all their meals in bed, and 30% used bedpans; approximately 40% washed or were washed in bed. In a similar institution 80-90% had meals in bed, and similar figures were obtained for washing in bed and for the use of bedpans; thoracoplasty patients are kept strictly in bed for all purposes for six months. Again, at a sanatorium two-thirds of the patients have some meals in bed, while about a third have all meals served to them in bed. Here thoracoplasty patients are nursed completely in bed for three months and get up a little during the second three months.

Another relevant point of difference between the two countries is that while, over here, pulse and temperature are generally taken and charted by a nurse for every patient twice daily, in Switzerland patients take and record their own temperature. The pulse may be taken once or twice a week by a nurse but careful temperature and pulse recordings are generally only made by the nursing staff in special instances—e.g., on admission for

1. Heaf, F. *Tubercle*, 1948, 29, 2; see *Lancet*, March 13, p. 414.

a week or two, and round about the time of any operative interference. In the cantonal sanatoria the majority of patients make their own beds, though they are not allowed to turn the mattresses.

A detailed inquiry would, I am sure, confirm the differences indicated in these somewhat sketchy notes.

#### POSSIBLE APPLICATIONS HERE

Is it any wonder that with our present standards we have too few nurses for too many patients? But is it justifiable to continue to maintain such standards while beds are empty and waiting-lists mount? I do not advocate that we should go all the way in embracing the methods prevalent in Switzerland. Their procedures must have been largely forced upon them by the fact that they have always been short of nurses for this type of work and it might well be that given more nurses their methods would move somewhat in our direction. But should we not face our own inexorable position and move in the direction of the Swiss experience in order to give our best services to the tuberculosis population and to the community?

If there is doubt about the clinical desirability of letting patients out of bed to wash and go to the lavatory, we have to decide how much harm we think would be done and then balance this factor (and it may be problematical and imponderable) up against the great undoubted harm that will continue to be done by allowing our appalling waiting-lists to mount. Few, if any, sanatorium physicians can take the view that this waiting-list is no problem of theirs; indeed they must be truly concerned, as apart from their public-health conscience and their views on the prevention of infection they have a direct interest in the stage of disease at which their patients are admitted. All must agree that nothing could be more deplorable than the continuation of conditions which make it necessary for many months of delay between diagnosis and treatment. A tuberculosis scheme run on such lines must go far to defeat its own object.

But in fact might not sanatorium patients really benefit if we adopted some of the nursing methods outlined above in a judicious way? I feel certain that few patients who are capable of walking to the lavatory will not be all the better physically and mentally for so doing. And—though this decision would possibly require a little more individual care—are there many patients who if washed in bed will get better, yet if allowed to wash in the bathroom will, as a result, fail to get on top of their disease? Service of meals, bed-making, and the taking of temperature and pulse should all be seriously reconsidered in the light of the circumstances in which we find ourselves.

Another angle of these problems is not unimportant. In a cantonal sanatorium of 110 beds I recently watched the thoracic surgeon at work in the theatre and was struck by the presence of at least half the total nursing staff.

Would tuberculosis work not be more attractive if the nursing was more concentrated on essentials, and freed in the way suggested from a great deal of routine not always of a pleasant nature? Is there not here a case for action worthy of consideration by tuberculosis administrators and clinicians alike? No sanatorium can afford to neglect to review continuously the work of its nursing personnel from all angles. Any sanatorium with more than 15 nurses per 100 patients would be well advised to give the most careful consideration to the particular problems indicated in this short communication. I suggest that a useful approach would be to hammer out the details locally by means of a small committee, consisting of a tuberculosis physician and a thoracic surgeon together with a member of the nursing staff.

Though the matters dealt with in this article are somewhat prosaic, a great deal is at stake. The central problem involved—the tuberculosis waiting-list—is real and grave.

## IMPROVEMENT OF THE NATIONAL DIET\*

DIET is conditioned partly by levels of purchasing power and partly by a number of habits or fashions. These habits are often sanctioned by generations of custom and are usually accepted without argument. Where varied foods are available, and where people have the money to buy them, the average diet tends itself to become more varied. It may or may not become a better diet; but some improvement at least is probable. Though people cannot be forced to take foods they do not like, a well-planned scheme of education may in time modify habits and change the national diet for the better.

Since a sound diet is recognised as one of the indispensable foundations of the health of a community, the final issue of the work of the nutritional scientist lies in the improvement of the human diet. But the task of applying our knowledge falls to a dispersed team of administrators, medical men, teachers, health workers, dietitians, catering workers, and members of voluntary organisations. To them is committed, so to speak, the social function of influencing the food habits of the community over a period of time.

We think first in terms of essential requirements—the necessary intake of calories, protein, vitamins, and mineral salts. But for practical purposes we have to convert these into the terms of the available foods as purchased and consumed. We do not for example usually tell people to raise their calcium intake; we tell them to drink more milk. Few men and women will make even a passing reference to the tables of food values; if they think of the matter at all, they merely trust that their natural or acquired tastes will somehow accord with good dietetic principles.

It is the custom among civilised nations to promote special food services for what are called the "vulnerable groups" of the population. The schemes may in themselves go far towards the creation of a soundly nourished community, especially where they cover a large proportion of children and of expectant and nursing mothers. But most of the food consumed is still purchased in the retail market, where the only guide to the purchaser with the money to spare is his taste and discrimination. It should be one of the aims of a free society so to educate its members that they are prepared to review their personal tastes in the light of scientific knowledge.

The dietetic proposals made by the Technical Commission of the League of Nations in 1938 have not in essentials been modified by subsequent research. In applying these proposals, however, it is necessary to suggest rather the broad direction in which we should seek to mould the common taste, than the precise quantities of any food that should be consumed. The only exception to this is the minimum that may be fixed for the members of the "vulnerable groups."

Food cannot be consumed until it is produced; and it cannot be safely produced unless there is a secure demand. Neither producer nor consumer has a fair deal unless the foods pass quickly and cheaply through all the processes of distribution. Our proposals therefore concern not only the consumer but the producer and those who have to guide our distributive policy. Nevertheless, much lies within our special province of education.

#### CHOOSING THE COMPONENTS

We believe that the following points will commend themselves to all who are concerned with applying the science of nutrition to social betterment.

1. *General.*—There are some foods (meat is probably one of them) for which the people of this country have obviously a well-established taste. So far as we can at

\* Report to the Central Council for Health Education from the advisory committee of its *Nutrition Bulletin*—namely, Mr. E. R. BRANSBY, D.S.C., Mr. F. LE GROS CLARK, M.A., Dr. JOHN KERSHAW, Miss E. M. LANGLEY, Dr. H. E. MAGEE, Prof. J. R. MARRACK, M.D., Mr. MAGNUS PYKE, Ph.D., and Dr. ROBERT SUTHERLAND.

present judge, the demand for such foods will rise considerably with the relaxation of rationing. Thus, while meat, eggs, fats, and fruit are all to be commended as of value in their various ways, we see no advantage in urging a greater consumption of them until we know at what level the demand will finally stabilise. We may, however, hope that egg production will be increased as soon as is practicable. Eggs are a compact and balanced source of essential nutrients, especially for children and for pregnant women; and like fats and milk, they greatly enrich the resources of the kitchen.

2. *Milk*.—Milk provides a sound basis for the diet at every age; and, in general, the value of skimmed milk as part of a mixed diet may also usefully be advertised, since, except for the fat and the fat-soluble vitamins, it contains all the nutrients of whole milk. Care must be taken that in our need to increase milk production we do not sacrifice quality to quantity. It is timely to examine ways in which milk may be made more attractive to children, as, for example, by its use in the preparation of pure ice-cream.

3. *Cheese*.—By most European standards the average pre-war consumption of cheese in this country was low; and, even if the supply of all foods returns to its pre-war level, there seems no reason to assume that the demand for cheese will spontaneously rise. Yet cheese is a valuable food, especially in the diet of the adolescent. As soon as supplies are available, the taste for cheese and cheese dishes might well be cultivated, since cheese could replace a portion of the meat in the diet, not only safely but often with advantage. There is, too, much scope for the production of fresh varieties of cheese likely to satisfy the British palate.

4. *Fish*.—The need for spreading a knowledge of the properties of white fish may not be immediately pressing, since white fish, at all events as fried fish, is already in wide demand. The herring, however, is dietetically a more valuable fish; and the supply of herring seems unlikely to diminish in the foreseeable future. The problem here is to discover in what form the herring will be acceptable to the British consumer. Popular taste, from whatever cause, has turned against the herring; and the task of re-establishing a taste for it will be a tedious one, unless the resources of modern technology are used to devise some way of making it not only cheap but attractive. The whole problem of the handling and distribution of fish seems, in fact, to be a fitting subject for more detailed research.

5. *Vegetables*.—Vegetables of all kinds might well be eaten more generally by the British consumer. We do not think it useful for the educator to lay undue stress upon the differences between one vegetable and another. The taste of the public is fairly catholic; and an increase in the liking for all vegetables will undoubtedly mean an increased consumption of those of higher nutritive value. The war-time consumption of potatoes should be maintained as far as possible. Several of the salad vegetables most in use have no great value; and possibly the first step is to discover which vegetables are most preferred, and then by crossing and selection to increase both their availability and their vitamin content. This would at least be better than an attempt to persuade the public to eat vegetables for which they have no marked preference. While the serving of raw and salad vegetables to school-children may often be of benefit, it is on the whole advisable not to base our educational work on the claim that we are merely helping to meet the body's vitamin requirements; we shall have better results if we recommend vegetables in general as attractive foods. The habit of serving vegetables and fruit daily should be promoted. Finally, to provide us with the information we need if we are to inculcate sound habits, the studies already undertaken into the taste for vegetables and the methods of their preparation should be continued.

6. *Flour*.—All the weight of evidence seems now to be in favour of lightly milled flour. Despite the apparent preference for white flour, the importance of retaining as much as possible of the minerals and of the vitamins of the B complex can no longer be disputed. Milling practices should therefore be adapted to provide the public with lightly milled flour of an attractive quality. In the present state of our knowledge an extraction-rate of about 85% seems likely to ensure this. The extent to which flour used for confectionery should be lightly

milled depends on the proportion of confectionery in the total flour consumption. Positive and persistent education will be needed to commend to the public the value of the lightly milled flour.

7. *Sugar*.—Comments have been made elsewhere on the high pre-war consumption of sugar in this country. A considerable proportion of this sugar, possibly a third of the whole, was used for the manufacture of cakes, confectionery, jam, syrup, and chocolate. There was thus a high consumption of sweetened starchy foods; and the displacement of part of these by foods of better nutritive value would improve the national diet. Moreover, a large intake of sugar, especially among children, tends to encourage the taste for sweetened foods at the expense of other foods. The diet would be improved if it were the custom to consume bread made from lightly milled flour in association with vegetables of high vitamin content such as tomatoes, and with dried fruits which are a useful source of iron and calcium. In any case, the desirable changes should be introduced without an undue disturbance of our consuming habits.

8. *Fruit*.—Fruits, both fresh and dried, and the products of these fruits vary widely in their value. But where many types are seasonal and many are imported, little can be done beyond informing the public which fruits possess, in fact, a higher nutritive value. There is probably scope for the plant-breeder to increase the vitamin content of many home-grown fruits. In the main, however, our work should be directed to the removal of any lingering prejudice against the consumption of fresh fruit, and towards a development of the belief that fresh or dried fruits are among the supplementary foods upon which the consumer can best spend his money.

9. *Requirements of special groups*.—It is, of course, impossible here to recommend diets suitable for the whole community. But some consideration must be given to the physiological needs of special groups of the population, as defined by age, bodily condition, and occupation. As far as infants are concerned, the value of breast-feeding, the need to encourage it, and the desirability of a closer study of the factors affecting the flow and quality of breast-milk should not be overlooked. The public should understand the physiological changes that take place throughout the whole period of pregnancy and child growth; and they could be assisted to relate these to the obvious nutritional needs at each stage. The requirements of the adolescent might be more carefully studied than they have been in the past; and we have finally in the needs of the ageing a new field of investigation that will be of increasing social importance.

#### THE OBJECTIVES

Our ultimate purpose is simple enough. We take it for granted that the common diet will tend to assume a rational balance when foods are available, but with these provisos—that the fashion for milk and lightly milled flour is well established, that the popular taste shows a shift towards cheese and fat fish, and that there is a trend towards higher consumption of vegetables and fruit. If these positive results accrue, there will be a natural and corresponding decline in the consumption of such products as might, through their lack of protective value, throw the diet out of balance. A liking for variety should be encouraged as far as is possible; and instruction should invariably be associated with the promotion of a high standard of cooking and kitchen craft. The measures already taken to establish minimum standards of quality for all processed and manufactured foods should be maintained and extended in the interest of the consumer; and they should include regulations on the production of an attractive, lightly milled flour and on the maintenance of a supply of safe milk of high nutritive quality.

But simple as are these aims, the means of attaining them are not necessarily simple. On the contrary, they demand careful thought and planning, since to mould the food habits of a free community into a new pattern is no light task. Nevertheless, to make clear our objectives is to gain the first of them—the agreement of a widely dispersed team; of men and women on the common task that lies before us.

## B.M.A. PLEBISCITE RESULT

TABLE I

(1) Reference to Plebiscite Form	(2) Classification of professional work	(3) Registered medical practitioners either resident in Great Britain or serving in H.M. Forces at home or overseas (54,667 plebiscite forms issued)						
		England and Wales		Scotland		Total, Great Britain		
		Approve	Dis-approve	Approve	Dis-approve	Approve	Dis-approve	
A  "I APPROVE of the National Health Service Act, 1946, in view of the modifications now proposed by the Government."  "I DISAPPROVE of the National Health Service Act, 1946, notwithstanding the modifications now proposed by the Government."	1a. Consultant or specialist, not holding whole-time salaried post .. ..	1068	2526	168	274	1236	2800	
	1b. Consultant or specialist, holding whole-time salaried post .. ..	787	530	132	74	919	604	
	2. General practitioner, principal ..	4679	9802	785	1040	5444	10,842	
	3. General practitioner, assistant ..	629	1144	158	173	787	1317	
	4. Whole-time voluntary hospital ..	1010	1593	208	278	1218	1871	
	5. Whole-time local authority general hospital .. .. .	474	517	62	55	536	572	
	6. Whole-time local authority special hospital .. .. .	361	341	60	88	421	429	
	7. Whole-time public health service ..	784	883	102	120	886	1003	
	8. Whole-time Government service ..	255	290	68	52	323	342	
	9. Whole-time teacher .. . . .	219	151	50	65	269	216	
	10. Whole-time research .. . . .	149	103	24	20	173	123	
	11. Other whole-time non-Government post .. . . .	151	207	21	34	172	241	
	12. Medically qualified dental surgeon ..	19	199	15	45	34	244	
	13. Retired .. . . .	638	2321	127	295	765	2616	
	14. Unclassified .. . . .	695	1297	135	227	830	1524	
			11,918	21,904	2095	2840	14,013	24,744
	15. Services, permanent commission ..	..	..	..	..	179	410	
	16. Services, temporary commission, specialist .. .. .	..	..	..	..	53	69	
17. Services, temporary commission, graded specialist .. .. .	..	..	..	..	88	106		
18. Services, temporary commission, general duty officer .. .. .	..	..	..	..	287	513		
					607	1098		
	Totals .. .. .				14,620	25,842		

TABLE II

B  "I AM IN FAVOUR of accepting service under the Act in view of the modifications now proposed by the Government."  "I AM NOT IN FAVOUR of accepting service under the Act notwithstanding the modifications now proposed by the Government."		In Favour	Not in Favour	In Favour	Not in Favour	In Favour	Not in Favour
		1a. Consultant or specialist, not holding whole-time salaried post .. ..	1347	2148	234	197	1581
1b. Consultant or specialist, holding whole-time salaried post .. ..	916	360	161	42	1077	402	
2. General practitioner, principal ..	6586	7757	1050	736	7636	8493	
3. General practitioner, assistant ..	808	957	195	138	1003	1095	
4. Whole-time voluntary hospital ..	1249	1328	253	228	1502	1556	
	Totals .. .. .	10,906	12,550	1893	1341	12,799	13,891

TABLE III

C  "I AGREE to abide by the decision of the majority and undertake not to enter the Service if the answers to section B reveal a majority against undertaking service as defined in para. 4 of preamble and if so advised by the British Medical Association."  "I DO NOT AGREE to abide by the decision of the majority if it is against accepting service as defined in para. 4 of preamble."		Agree	Do Not Agree	Agree	Do Not Agree	Agree	Do Not Agree
		1a. Consultant or specialist, not holding whole-time salaried post .. ..	2589	850	257	154	2846
1b. Consultant or specialist, holding whole-time salaried post .. ..	487	717	73	121	560	838	
2. General practitioner, principal ..	9506	4413	979	748	10,485	5161	
3. General practitioner, assistant ..	1202	516	198	122	1400	638	
4. Whole-time voluntary hospital ..	1590	928	307	167	1897	1095	
	Totals .. .. .	15,374	7424	1814	1312	17,188	8736

## In England Now

### *A Running Commentary by Peripatetic Correspondents*

A NEW form of catapult is now the fashion in our part of London, and in the last week I have seen two boys whose sight has been permanently impaired by it. I have not seen the weapon, but it consists of a piece of elastic and a supply of the sharp wire staples used for fixing wire-netting on fowl-houses. In one case a staple had caused a traumatic cataract and in the other a severe laceration of the cornea. There has also been a revival in the popularity of the bow-and-arrow, and I have lately seen three cases of arrow wounds of the cornea—nasty stellate lacerations which in each instance led to loss of the eye.

Some skilful propaganda is needed to convince the older boys, who lead schoolboy opinion, that shooting staples and arrows about in crowded streets is neither good fun nor good sport.

\* \* \*

"Shan't be a minute old chap. I only want to look at one picture, and that's a matter of politeness." So said one candid art viewer to his friend, as they brushed past me on the steps of Burlington House. The rest of us who had a little more time to spare found a good deal more to interest us. But it is true that the private view of the Royal Academy does have something of the clannishness of our candid friend. Besides the professionals there are a lot of people there—many of them in extraordinary hats—who have come to see pictures by or of their friends. For the medical coterie the highlight this year is, of course, Mr. Henry Carr's picture of the council of the Royal College of Surgeons whom he has grouped effectively beneath the portraits of their predecessors. Mr. William Dring has painted Dr. Elizabeth Bolton resplendent in academic robes of purple and scarlet, and Sir Gerald Kelly shows an effective portrait of Mr. Somerset Maugham who is a medical man in fact if not in practice. Many doctors will also recognise Sir George Elliston chatting with two friends in Mr. Francis Hodge's picture for the Framlingham Old Boys' Association. Among the sculpture there is a smiling bronze bust of the late Sir Henry Gauvain by Mr. Charles Pibworth, a head of Sir Alexander Fleming by Mr. E. Roland Bevan, and Dr. F. R. Bettley, one of the medical exhibitors, has contributed the head of an Arab boy in cement.

\* \* \*

As on the similar occasion at Balaclava, 600 lined up for the M.R.C.P. examination. But 198 of the Light Brigade came back, whereas the big guns of the college accounted for all but a bare hundred.

Luck in the draw in the clinical examination is unavoidable and must often be a decisive factor, for mighty few of us are free from blind spots. "D—n it," ejaculated one candidate, "I'm a dermatologist and I've been landed with a nerve case." I murmured commiseration. "I wish you had been here yesterday," I said. "We had a case of Darier's disease and you could have told us all about it." And yet that dermatologist put up a performance of which Queen Square would not have been ashamed. The reverse was equally unexpected. A child with chorea was allotted to a brisk young doctor who announced that he had been specialising for two years in children with rheumatic hearts, and then exhibited almost complete ignorance of this condition.

Then there was an entertaining sort of Dr. Procrustes, who, having made up his mind on a certain diagnosis, wrote down all the physical signs that would be expected, with a confident repudiation of responsibility for their actual existence. I liked the bulldog spirit of another candidate to whom had fallen a tabetic who had walked straight out of the textbook with everything positive, even gastric crises. Our man diagnosed disseminated sclerosis. "It is rather unusual, is it not," I demurred, "to find the knee-jerks completely absent in disseminated sclerosis?" He paused, but only momentarily. "Ah," said he, "this must be one of those cases in which the knee-jerks are congenitally absent."

They come from all over the world, so the examiners get a liberal education. There was the excessively friendly gentleman who tried to establish a professional camaraderie but at the end of fifteen minutes had found only one thing we had in common—that we had both seen the Pyramids. There was the extremely cautious and suspicious candidate with a latent period of fourteen minutes; an impartial onlooker would have been puzzled to recognise who was the examiner and who the examinee. His opposite number from another part of the Empire barely waited for the first question before releasing a torrent of incoherent verbiage before which I could only subside helplessly.

One pathetic little man prefaced his every statement with cries of self-reproach and gestures of despair in an appeal ad misericordiam. And one more artful candidate began to refer to "a sl—" then checked himself and continued, with an arch smile and wag of the head. "Ah, sir, I know you're allergic to the adjective 'slight.'" It would be instructive if we examiners could meet some of the weirder-seeming candidates under more normal conditions, when they would not be prepared by a succession of sleepless nights and we would seem (in two senses) on the level.

\* \* \*

In Paris spring was raising her slightly embarrassing head. On every side one saw signs of the transference of the Id's allegiance from the Adlerian to the Freudian school. Nor were the symptoms lacking. Walking along the Boulevards, one's path would suddenly be blocked by a dallying couple going into a mild clinch, which seemed natural enough in the setting. No sooner was this obstacle circumvented than one had to veer to avoid taking the wind from the sails of a fully fashioned New Look sailing her stately, if somewhat stiff, course down the street. "The proper study of mankind is woman," it seems, even though the thoughts (and newspapers) of Frenchmen are full of the incompetence of governments, the perfidy of foreigners, and the international situation. How refreshing it is, this wandering in the warm air along the Boulevards at midnight, with all the cafés still open. Two years in England makes one forget that such a world exists.

In our visit to the hospital, which was the official reason for our trip, we found the clinics crowded with students and doctors from all over the world. The teaching (as far as we saw it in the presentation of cases) was excellent, but we came away with the feeling that treatment was too much inspired by enthusiasms, and that the patient on the Continent is still apt to be looked on as merely an appendage to his disease.

\* \* \*

Our ironmonger prides himself on satisfying everyone's needs, so when I stumped him with a request for methylated spirit he explained. There had, it seemed, been an embargo on deliveries until the inspector came round; he had called the day before, and now the meth. would be in on Monday. I asked if customers were suspected of drinking the stuff, but no; his purpose in coming was to see that the letter "A" had not been frivolously removed from above the door. I looked round, and sure enough there was a large "A," dimmed by the years but still distinguishable, over the inside of the front door. "Is that all he came for?" I asked. It was not. He also had to see that the letter "B" still hung over the entrance to the storeroom. The ironmonger didn't know what the lettering meant; and the inspector, an old hand, had also owned himself ignorant. "What about 'C'?" I inquired. The ironmonger shook his head: "I suppose that's the customer," he said.

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I hope that my future experience of conferences will be as enjoyable as my first—the annual meeting of the British Pædiatric Association at Windermere. The conference was blessed not only by the lords of pædiatrics but also by the lord of the weather. The change from a small room in a murky industrial town to a spacious apartment with french windows opening on a lakeside lawn was almost as refreshing as rowing in the moonlight on the still untroubled water.



## Letters to the Editor

### FOLIC ACID AND THE NERVOUS SYSTEM

SIR,—Dr. Jukes's letter of April 17 draws our attention to evidence that effectively disposes of the suggestion that folic acid interferes with glutamic-acid metabolism. But his deduction that folic acid can therefore safely be given to patients with pernicious anæmia surprises us considerably. This statement and his suggestion that alleviation of the anæmia may bring the neurological symptoms into greater prominence are surely contrary to the observed facts.

The suggestion that when the anæmia has improved the nervous symptoms may be worse makes us think that Dr. Jukes has had little experience of the clinical course of pernicious anæmia. The actual course of events is surely quite different. In the patient with pernicious anæmia who has an initially low blood-count, the neurological symptoms improve strikingly as the anæmia responds to adequate and proper treatment; some of the sensory symptoms are liable to persist but they are never more prominent than before treatment. The patient whose combined-system disease resists treatment or becomes slowly worse is the patient who has had little or no notable anæmia.

The observation that patients with pernicious anæmia, when treated with folic acid alone, are liable either to the sudden appearance of neurological symptoms not previously present or to the worsening of symptoms initially present was unexpected and disappointing; but since Spies and Stone<sup>1</sup> described these, similar observations have been made by many others and have been summarised both in leading articles in your columns<sup>2</sup> and by Wilkinson.<sup>3</sup>

Dr. Jukes quotes three groups of authors as presenting the opposite views, but these are unfortunate examples for these reasons:

1. Doan et al.<sup>4</sup> reported a single case followed for a short time on small doses of 2 mg. intravenously for 20 days.
2. Hall and Watkins<sup>5</sup> had treated 14 cases for short periods of 24 days to 9 months, but they actually said that although folic acid relieved the peripheral neuritis in some cases recurrences were common if these were kept on folic acid alone; and subacute combined degeneration of the cord developed as a new manifestation in a significant proportion of cases 2-5 months after the treatment.
3. Bethell and Sturgis<sup>6</sup> had 6 out of 15 patients with nervous-system disease before treatment with folic acid; in a footnote they add that one had already developed severe paraplegia while receiving 10 mg. daily by mouth, during the interval between submission of their manuscript and receipt of the printer's proof.

Our own experience shows that it may be from 2 months to 2 years before the signs of disease of the central nervous system appear. In a group of 18 patients treated with folic acid, 10 eventually had to be taken off this treatment because of neurological signs which appeared at times varying from 3 to 21 months after treatment had begun; 3 patients who had neurological symptoms when treatment with folic acid began had to be taken off 6 months later because of worsening symptoms; 4 patients who have had folic acid alone for 13, 17, 21, and 22 months have so far remained free of neurological symptoms; and one patient who died of bronchopneumonia also had no nervous-system symptoms after 6 months' treatment. All affected patients eventually recovered when treated with preparations of desiccated stomach, or of liver injected intramuscularly. We have already collected from our own and other reports 60 patients who have developed severe neurological symptoms, out of 180 patients treated with folic acid.

In our view these findings emphasise that the patient with pernicious anæmia who is treated with folic acid alone is in grave danger of the sudden development of neurological disturbances that may take months or

longer to rectify. Therefore we agree with you, Sir, that folic acid alone or together with liver should not be used for the treatment of patients with pernicious anæmia who show any signs of involvement of the nervous system, and we would go further and urge practitioners to avoid folic acid altogether in the treatment of pernicious anæmia. The place of folic acid in therapeutics is surely in the treatment of megaloblastic anæmias other than pernicious anæmia.

Department of Hematology,  
Royal Infirmary, Manchester.

JOHN F. WILKINSON  
M. C. G. ISRAËLS.

### TUBERCULOUS MENINGITIS

SIR,—In the report (April 17) of the streptomycin in tuberculosis trials committee of the Medical Research Council, mention is made of the finding of a definite history of contact with diagnosed tuberculosis in the home in 35 out of 92 cases of tuberculous meningitis.

It may be of interest to record that in this area during the past five years 23 cases of tuberculous meningitis have either been notified or been abstracted from the death returns. None of these cases came from a house where there was a known case of tuberculosis, and a skilled health visitor was able to obtain a family history of tuberculosis in only 6 cases. In only 2 cases had there been any recent contact with known tuberculosis outside the household.

In this area tuberculous meningitis does not appear to occur in families where a known case of tuberculosis exists; instead, the appearance of a case of meningitis has often led to the discovery of infection in a relative or friend who was unaware of the cause of his, usually mild, symptoms.

R. GRENVILLE MATHERS  
Clinical Tuberculosis Officer.  
Wallasey.

### PAPWORTH VILLAGE SETTLEMENT AND REHABILITATION

SIR,—When the Disabled Persons (Employment) Bill became law it was apparent to workers in the tuberculosis field that the facilities for training and employment provided therein, while suitable for the ordinary disabled person, could hardly be applied to the man or woman disabled by tuberculosis. For some time past negotiations have been going on between Papworth Village Settlement and the Ministry of Labour to provide some scheme for training which would be of assistance to the tuberculous.

The Ministry of Labour has now agreed to recognise as vocational trainees all trainees (other than Ministry of Pensions cases) at Papworth who are able to work for at least three hours a day. This recognition will extend to those who have completed their sanatorium treatment elsewhere as well as to patients who have received their sanatorium treatment at Papworth. The following terms have been agreed:

1. Training allowances will be paid each week to all recognised trainees as follows: men 35-50s. and women 28-43s., according to number of dependants and other circumstances; young men 22s.-26s. 6d. and young women 21-24s., according to age. Sickness benefit will not be payable.
2. The Ministry will pay hostel charges in respect of each recognised trainee at the rate of 28s. per week for men and 22s. 9d. per week for women.
3. No training grants will be paid to the settlement by the Ministry.
4. The period during which the Ministry will pay training allowances will depend on the trainee's progress. It is understood that the average period is likely to be well under two years. In no case will allowances be paid for more than three years.
5. When a trainee has finished training he will be considered for colonisation in the settlement at the trade-union rate.
6. Quarterly reports will be rendered to the Ministry of Labour, and where it appears that the trainee is unduly prolonging the period of training or otherwise seems unlikely to benefit from further training, the settlement will advise the Ministry to terminate training. Reports will also be rendered if desired to the local authority responsible for treatment.

This scheme will enable local authorities to send selected cases to Papworth at less cost than hitherto as part of the cost of maintenance will be borne by the

1. Spies, T. D., Stone, R. *Lancet*, 1947, 1, 474.  
2. *Lancet*, 1947, 1, 182; March 6, p. 371.  
3. Wilkinson, J. F. *Brit. med. J.* 1948, 1, 771.  
4. Doan, C. A., Wilson, H. E., Wright, C. S. *Ohio St. med. J.* 1946, 42, 139.  
5. Hall, B. E., Watkins, C. H. *J. Lab. clin. Med.* 1947, 32, 622.  
6. Bethell, F. H., Sturgis, C. C. *Blood*, 1948, 3, 57.

Ministry of Labour (see 2 above). The decision as to suitability for admission to Papworth and to the scheme will rest entirely with the medical staff at Papworth who will require full clinical details and X-ray films in each case from the tuberculosis officer.

Both the committee of management of Papworth Village Settlement and the Ministry of Labour feel that this is a considerable step forward in the rehabilitation of the tuberculous and anticipate its extension in the future. To this end the Ministry has undertaken to provide half the cost of two hostels of 50 beds each for men and women at Papworth.

Papworth Village Settlement,  
Papworth Hall, Cambridge.

RICHARD R. TRAIL  
Medical Director.

### BACK STREET SURGERY

SIR,—A trickle of inquiries and a few new members have resulted from your kindly review of the Abortion Law Reform Association's latest publication *Back Street Surgery*. I feel sure that we should gain increased medical support if your readers could examine the association's collection of press reports of abortion cases heard in the criminal courts during the past 12 years. These tragic stories get little publicity in our leading daily newspapers. If each were to be as widely reported as are other tragedies, cumulative horror might arouse the public conscience to the necessity of clarifying our abortion law.

Usually abortion fatalities are the result of interference by an unskilled "helper"; but many follow on attempted self-induced abortion. Recently a single batch of press cuttings contained reports of inquests on two married women each of whom had been found dead by her husband. One, a mother, had expired alone and unattended whilst seated in a few inches of bath water; the other, also a mother and also alone and unattended, had collapsed and died on the bedroom floor whilst douching herself. The verdicts were identical—death from attempted self-induced miscarriage.

Recent police-court history has shown us what can happen under present law when medical practitioners take the risk of giving skilled help in cases which to them seem in need of it. When enough people within the medical profession join in the demand for reform, it can be clearly established that it will henceforth not be criminal for a qualified medical practitioner to terminate the pregnancy of a woman with her consent, when this appears to be medically justified.

53, Gloucester Terrace,  
London, W.2.

ALICE JENKINS  
Hon. Secretary, The Abortion  
Law Reform Association.

### BLOOD-SUGAR LEVELS IN SLOW STARVATION

SIR,—The valuable paper by Dr. Chakrabarty in your issue of April 17 should be read in conjunction with Simonart's *La Dénutrition de Guerre* (Brussels, 1947). These two studies suggest several important questions:

1. Is the low blood-sugar often found in prolonged starvation due not to lack of food from which glucose can be obtained, but instead to an exaggeration of the body's normal capacity to turn sugar into fat—a pathological exaggeration so great that it may persist in spite of a fatal hypoglycæmia? This would appear to be the only explanation of the low blood-sugars and high respiratory quotients found by Simonart: the quotient was often above unity, one being as high as 1.95—a figure higher than that recorded for the carbohydrate-fattening goose (1.33) or hog (1.58).

2. Is this lust of the slowly starved body for making fat a sign that there comes a stage in starvation when the fat of the tissues has to be replenished whatever the cost?

3. Are the attacks of sudden acute fatigue, clinically resembling hypoglycæmia, which occur most commonly in thin people and which are promptly relieved by sugar, due not to lack of glycogen reserves but to a sudden demand by the thin body for fat formation from sugar, even at the expense of reducing the blood-sugar below the minimum necessary?

4. Is the diabetic with his low respiratory quotient the reverse of the starving man with a high respiratory quotient? Are the biochemical changes in starvation and in diabetes merely examples of upsetting—but in opposite directions—the normal balance between fat and sugar formation? Is the diabetic not primarily incapable of metabolising sugar, but is he merely suffering from a pathological exaggeration

of the normal capacity to convert fat and protein into sugar—a normal capacity seen in its extreme in the hibernating marmot with a respiratory quotient of 0.3? If this is so then it is reasonable to postulate further that this exaggerated demand to form sugar will carry with it the physiologically related demand for excretion of sugar reserves into the blood: therefore the fatty diabetic liver is full of fat which it turns to sugar, and empty of this sugar because it hands it on to the blood.

To go back a stage further, has the diabetic got a blood-sugar "set" at a very high level which he attempts to achieve by normal physiological processes?

5. Is the ketosis of diabetes due to such an overriding priority being given to sugar formation that the breakdown of fat is interrupted at the aceto-acetic acid stage—that is, at the stage to which fat must be broken down before it can be built up again into sugar?

6. Was Allen's pre-insulin starvation treatment for diabetics effective—when it was effective—because this stimulated the body to reverse its exaggerated conversion of fat into sugar in favour of a conversion of sugar into fat, as may occur in starvation?

London, W.1.

FRANKLIN BICKNELL.

### JOHN HILTON

SIR,—We are preparing an entirely new edition of John Hilton's surgical classic *Rest and Pain* to be published by Messrs. G. Bell & Sons Ltd. the publishers of the original lectures. We should be most grateful to any of your readers who can give us any information that might help us in this work. As we propose to include a short biographical note on Hilton we would welcome details of his life—especially his early life—and the loan of any portrait suitable for reproduction.

Middlesex Hospital Medical School,  
London, W.1.

ELLIOT E. PHILIPP  
E. W. WALLS.

### PNEUMONIC PLAGUE

SIR,—The article by Dr. Wynne-Griffith in your issue of April 24 points out clearly that pneumonic plague is not as infectious as it is generally thought to be. I should like to refer to an outbreak of pneumonic plague that occurred at Nyaunglebin, which is 100 miles north of Rangoon.

The cases presented themselves in much the same way as those seen in Rangoon by Wynne-Griffith. Pneumonic plague was not suspected at all till a public-health inspector casually remarked that there had been an epidemic of pneumonic plague in the same locality a few years before. In Nyaunglebin also there were quite a number of people who, although they had come in close contact with cases of pneumonic plague (some of them had not even been inoculated against plague), did not themselves develop the disease.

A surprising fact which emerged from the Nyaunglebin outbreak was that pneumonic plague need not be fatal. An excellent report on one of the cases which did not prove fatal was published by my colleague Dr. Than Aung<sup>1</sup>; plague bacillus was found in the sputum of this case long after the acute phase was over. Another instance of recovery has been recorded by Clark and Goldberg.<sup>2</sup>

Than Aung's case raises certain important questions: (1) is it possible for pneumonic plague to be transmitted by convalescent carriers? (2) can a contact be a passive carrier without contracting the disease himself? The view held at present is that the disease is contracted by the inhalation of dust laden with bacilli, the bacilli being passed in the faeces of infected rodents. Another possibility is that of a small proportion of bubonic cases developing into secondary pneumonic ones. The possibility of carriers transmitting the disease is never considered, because it is assumed that pneumonic plague is always fatal. The cases recorded by Clark and Goldberg, of which one had an incubation period of as long as 12 days and another did not prove fatal; the finding of plague bacillus in the sputum of a convalescent case by Than Aung; and the observation by Wynne-Griffith and others that people in intimate contact with pneu-

1. *Indian med. Gaz.* 1947, 82, 275.

2. Clark, B. M., Goldberg, S. *S. Afr. med. J.* 1943, 17, 57.

monic plague cases sometimes did not develop the disease suggest another possibility in the epidemiology of the disease. This is as follows.

Benign pneumonic plague may appear during an interepidemic period and be diagnosed as bronchopneumonia or bronchitis. Increase in the virulence of the bacilli may subsequently result in an epidemic and recognition of the illness's true nature. After the epidemic a few of the undetected cases or contacts may become carriers; the only way to confirm this is by thorough bacteriological examination of the sputum of every contact. Dr. Than Aung showed me a smear of the sputum of a patient well on her way to recovery; and I was struck by the numerous bacilli swarming in it. This case was undoubtedly a potential danger to others.

London, S.W.1.

M. V. CHARI.

#### HOSPITALITY FOR GERMAN DOCTORS

SIR,—The Foreign Office (German section) is arranging to bring over from the British zone of Germany a number of doctors of influence in the profession, on visits to this country. The object of these visits is to renew contact between the profession in Germany and in the British Isles and to allow the visitors to see some of the developments in medicine which have taken place during the past years when they have been cut off from outside contacts.

The Medical Supplies Committee for Germany and Austria, of which I am chairman, has been asked to assist this scheme by arranging hospitality, mainly in London but possibly also in the larger provincial cities, so that expenses will be reduced and more doctors can come on such visits. Will any readers willing to offer hospitality for a week or a fortnight write to Mrs. Duff, 20, Parliament Hill Mansions, London, N.W.5, who will be responsible for these arrangements? We expect that all these visitors will have some knowledge of English so it is not necessary that the host should speak German.

Doctors in Germany have been faced during the past few years with tremendous difficulties due to shortage of supplies, influx of refugees, and the standard of living conditions, and we hope these visits will be an encouragement to them in their work. We shall be grateful to any doctors or friends who can help by offering hospitality.

SOMERVILLE HASTINGS

Chairman, Medical Supplies Committee  
for Germany and Austria.

House of Commons.

#### ATTACK ON RHEUMATISM

SIR,—The discussion arising from your leading article of March 27 has opened up some important questions that must be settled in the near future. The most important of these is the relations that should exist between rheumatology and physical medicine. Guidance towards the solution can be found in the history of these two subjects.

At the end of last century—i.e., shortly after the discovery of X rays—radiologists, who had mostly been practising electrotherapists, rapidly widened the scope and techniques of radiology to such an extent that separation was inevitable, and radiology became confined to diagnosis while electrotherapy dealt only with treatment. This divergence led to the formation of a separate section of radiology by the Royal Society of Medicine. The electrotherapists, who had also been widening their field by adopting new methods not covered by "electrotherapy," found in the spa practice (balneology) section a group of men who were skilled and constant users of physical methods, many of which were, again, no longer covered by "balneology." Thus was formed the section of physical medicine.

Tracing the further history of radiology, we find X-ray diagnosis and radium and X-ray therapy diverging into two entirely different subjects as a result of the stupendous advances of the last 15 years. There have also been startling advances in the methods of physical medicine and rehabilitation, which in many branches of medicine and surgery now play a critical part in aiding or accelerating recovery. Thus proper physical methods must be applied to prevent severe deformity after lobectomy or pneumonectomy, peripheral-nerve injuries, and, of course, in various orthopaedic conditions; while

in general surgery preoperative and postoperative rehabilitation can materially shorten convalescence. Apparatus and techniques are continually multiplying and becoming more accurate, as is exemplified in electromyography. Here, then, is a growing field of medicine whose future importance has been enhanced by recent atomic research; it should be closely allied to biochemistry, and the future specialist in physical medicine should also be the honoured biophysicist.

The study of the rheumatic diseases has also made great strides, especially in the past 15–20 years, aided chiefly by progress in general medicine. No longer does the rheumatologist turn primarily to physical methods for treatment. His first care is a basic diagnosis. In his subsequent attack drugs—whether penicillin, T.A.B., vitamins, gold, or endocrine products—find a leading place. In diagnosis he constantly encounters other serious diseases masked by a more obviously crippling arthritis; over 30 incidents of this kind were recorded during the treatment of the first 250 cases at the British Legion Unit. The rheumatologist of the future must therefore be primarily a sound and knowledgeable physician, but sympathetic to and informed on the value and scope of physical methods.

During the period of divergence there will be physicians who have some experience of both rheumatology and physical medicine. But it has become impossible to be first-class in both these subjects. Let the practitioner who wishes to specialise in this field decide whether his tastes lie along the lines of a physical approach, with its new and intriguing possibilities, or whether medicine shall be the background for his approach to the special diagnostic and therapeutic problems presented by the rheumatic diseases.

The results achieved by the British Legion Unit, both earlier and after it moved to London and opened its doors to both sexes and all classes of the community, have already been favourably commented on in your journal. They justify recognition of rheumatology as a distinct entity, the rheumatologist working in close association with the general physician, and with the orthopaedic surgeon and the physical-medicine specialist as constant and valued advisers.

The first practical steps to this end would be the formation of a section of rheumatology by the Royal Society of Medicine (ample membership would be found among the members of the keen and alive Heberden Society), and the institution by the University of London of a chair in rheumatology; the Senate are doubtless aware of the progress being made in Manchester University as a result of the Nuffield Foundation bequest. In this way the advances already made would be consolidated, the inroads of this major industrial disability checked, and the means for development and good recruitment provided.

London, W.1.

C. B. HEALD.

#### SHORTAGE OF SPECIALISTS?

SIR,—Surely it is time people stopped talking about a shortage of specialists. One has only to consult the superintendents or secretaries of hospitals to discover that they are snowed under with applications for any post advertised; and the teachers at the medical schools must be tired to death of writing testimonials and answering inquiries.

Now that the health service is to begin, may we, the unemployed, hope that practical steps will be taken immediately to organise an adequate hospital service? Could not the senior administrative medical officers of the regions compile a register, on voluntary lines, of unemployed specialists in their regions and try to fit them—with the consent, naturally, of the hospitals concerned—into the vacancies which presumably exist or will exist? After the hospital surveys they must surely have by now some idea of what staff will be needed.

Incidentally, when posts are advertised it would save much paper and wasted effort if they were to be starred. One star would mean that the advertisement is a formality, since the job is "fixed"; two stars that there is a local candidate but that he is not up to much; and three stars that the job is really open.

DEMobilISED F.R.C.S.

### THE PLEBISCITE

SIR,—In the B.M.A.'s latest plebiscite I was unable to record my vote because of the ill-designed form. For the purpose of easy and rapid analysis this form was designed on the self-coding principle—that is to say, alternative statements were formulated and each doctor was asked to mark with a cross the statement which coincided with his opinion. Unless this sort of form is designed with great care, the interpretation of results may be most inaccurate.

There must be others in the profession who, like myself, approve less and less of the National Health Service Act as the amendments become more and more numerous. How could we record our opinion on the form supplied to us? We have two alternatives: (1) to abstain from voting, as I, under protest, have done; or (2) to put a cross against the statement "I approve of the National Health Service Act 1946 in view of the modifications now proposed by the Government." Either action results in our opinion being improperly recorded. Probably people of my opinion are in the minority in the profession, but I understand that one of the principal attributes of democracy, the prerogatives of which are so jealously guarded by the B.M.A., is proper representation of minorities.

What is as important in the long run, however, is the abuse of a system which properly used can be of inestimable value to the medical profession. In these days of form-filling, forms should always be designed so that accurate information can be extracted with the least possible expenditure of money and labour. Consideration of the B.M.A. plebiscite form shows why information extracted from forms is so often regarded with suspicion by thinking people. If, because of inherent mistakes in the design of the form, the information is wrongfully recorded no amount of juggling with the figures afterwards will give a true picture of the situation.

Birmingham.

VERA NORRIS.

### LOST DRUGS

SIR,—Almost every week it appears necessary for the B.B.C. to warn listeners that some dangerous drug, often phenobarbitone, has been lost or stolen. Pharmacists in their businesses are subject to very strict regulations regarding the storage and supply of drugs of this character, and by carelessness on the part of the public many of these precautions (often irksome to the pharmacist) are being nullified. I have heard it suggested that the loss of dangerous drugs should become a punishable offence.

In order to alleviate the danger occasioned by the loss of these drugs, might I suggest to my professional colleagues that they might usefully fix a label to such packages stating that "this medicine is to be taken only by the person for whom it has been prescribed." Again, might I suggest to the medical profession that barbiturates and similar preparations should not be prescribed in quantities greater than the immediate need of the patient warrants? Lastly, might I urge upon the public at large to take much greater care of the very potent substances which are entrusted to their charge?

London, S.W.20.

F. C. WILSON.

### SENSITISATION OF PENICILLIN-RESISTANT STAPHYLOCOCCI

SIR,—Both Dr. Voureka (Jan. 10) and Dr. Winner (May 1) claim to have rendered penicillin-resistant staphylococci sensitive to penicillin by contact with a hæmolytic streptococcus. I should like to point out that since many penicillin-resistant staphylococci kept in the laboratory do not breed true, such claims are quite unreliable if based on the testing of single colonies.

Recently I plated out 32 such cultures, all penicillinase-producers, which had been kept in the laboratory for from 5 to 13 months, and from each plate I picked 50 colonies and streaked them across penicillin ditch plates. None of these strains had received any "treatment" beyond occasional subculture in lemco broth. Nevertheless, 2 had become 100% sensitive to penicillin; 15 gave a mixture of penicillin-

sensitive and penicillin-resistant colonies; and from only 15 were all 50 colonies penicillin-resistant. With the exception of the 2 strains that had become 100% sensitive, all appeared resistant to penicillin when tested in bulk.

The 2 strains specifically referred to by Voureka as having been rendered sensitive to penicillin by treatment with the Milne streptococcus were both included in this series; one (6652) was one of the two which had become completely penicillin-sensitive, while the other (7007) gave 32 penicillin-resistant colonies and 18 penicillin-sensitive. I have done similar experiments on 10 strains after growth in the presence of the Milne streptococcus without finding any significant increase in the number of penicillin-sensitive colonies.

It seems clear from these results that any experiments on rendering penicillin-resistant staphylococci sensitive must be controlled by a careful study of the natural mutation-rate of the culture that is being used.

Postgraduate Medical School of London,  
Hammersmith Hospital.

MARY BARBER.

### INTERNATIONAL STUDENTS' CONGRESS

SIR,—In July this year an International Clinical Congress of Medical Students—the first of its kind—is to be held in Britain, under the auspices of the British Medical Students' Association. Up to date 130 delegates from 30 different countries have accepted our invitation, and a programme of lectures, visits, and ward rounds in various teaching hospitals, discussions, and entertainments for the visitors has been arranged to take place in the universities of London, Oxford, and Birmingham.

The organisational expenses of the congress have been met by grants from the British Medical Association and the International Union of Students. The response to invitations so far shows, however, that delegates from many countries are experiencing difficulty in meeting the necessary expense of the attendance. The British Council has generously agreed to cover the congress fee for a number of delegates, but many countries will have to remain unrepresented unless further support is forthcoming.

May we therefore appeal through your columns for contributions from individual members of the public or from societies which have at heart the furtherance of friendship and understanding of students from all over the world, so that this important event will be truly international in character. Cheques will be gratefully received by the Treasurer, Students' International Clinical Congress, British Medical Students' Association, B.M.A. House, Tavistock Square, London, W.C.1.

JOHN A. RYLE

Hon. president of the congress.

STEPHEN DRANZ

President of the British Medical Students' Association.

HERBERT E. REISS

Chairman of the congress organising committee.

### TRANSFORMING THE HOSPITAL

SIR,—Mr. Pearson (March 20) has indicated that hospitals become rapidly out of date; and perhaps one reason is that in this country there exists no body comparable with the U.S. Public Health Service which is capable of analysing requirements and publishing their findings for the guidance of architects and others interested in hospital planning. Too much has been left to the individual architect, who has had to develop his own train of thought or borrow inspiration from foreign periodicals; these reproduce plans which, though excellent in themselves, are not necessarily suitable for this country. Perhaps collaboration between the architects and medical and technical advisers of the Ministry of Health will produce something for the guidance of the regional hospital boards.

The central-corridor plan which prevails on the Continent and in America is more suited to countries where the proportion of paying patients is high and the supply of nurses is better than we have here; for this type with its small wards is difficult to supervise with an inadequate nursing staff. This plan, with the wards on the south side of the corridor and the service rooms on the north side, means that cross-ventilation is non-

existent, lighting of corridors is poor, and noise from the ancillary rooms is so great as to prejudice the comfort of patients. The American reliance on artificial ventilation removes one objection; but one feels that sufficient natural cross-ventilation and the germicidal qualities of sunlight should receive better attention.

I should like to pay tribute to the valuable contribution to hospital planning made by Dr. McIntosh and Mr. Coales in your issue of May 10, 1947, when they described a type of plan eminently suitable to present British requirements. It has the great virtue of flexibility, which is achieved, firstly by the use of single and multiple bed wards, and secondly by the reintroduction of the much-despised sanitary annexe. Such an annexe has the advantages of isolating the service rooms from the patients and of suitability for expansion; it is chiefly with regard to the ever-increasing ancillary service rooms that the modern hospital plan differs from its predecessors.

London, W.C.1.

GORDON TAIT.

#### THE DOCTOR'S WIFE

SIR,—Most panel doctors will be in complete accord with much of what "Practitioner" says in his letter of April 17; but, if one is to be a doctor in the true sense of its medical connotation, and not a mere hewer of wood and drawer of water in the profession, one must combat by all possible means the complacent attitude both of himself and of "Encouraged" towards the question of certificates.

The man (and I have a particular one in my mind) who, at the onset of a slight cold, says, "I want to draw on my clubs, doctor," is both a menace to the financial stability of his clubs, and, what is worse, to some patient in the waiting-room whose chances of a thorough examination, which he may badly need, are diminished by this man's demand for four certificates and one prescription.

Only the other day an upstanding, well-looking man of 52 complained to me of an isolated attack of dizziness. In the ordinary way, he might have received a placebo, but my waiting-room happened to be empty and I gave him a thorough overhaul. Examination revealed aortic disease and an enlarged heart, later confirmed by a consultant who added that the E.C.G. showed he had bundle-branch block, and that the usual prognosis was about two years. Under the National Health Service a doctor is to be allowed to have a maximum of 4000 patients, and we are given to understand, it may be necessary for him to have *more* than this at first. If the incidence of coronary thrombosis in doctors does not rise with the introduction of the N.H.S. it will be a matter of some surprise; but one can have very little doubt that avoidable mortality will rise amongst the population from the doctor's sheer inability to give them a square deal. But it would appear that nothing matters to the politicians so long as the service is set in motion on July 5.

Hove.

G. L. DAVIES.

#### A BOOK REVIEW

SIR,—May I make brief reference to your review, on April 3, of my book *Breathing in Irrespirable Atmospheres?*

I am somewhat surprised to read that "the physiological treatment is weak"; in what way is left for readers to guess. I should have thought that my acknowledgment to Prof. Sir Leonard Hill, F.R.S., in the introduction would have been sufficient guarantee that this portion of the book was not prepared without the assistance of a recognised authority.

It was my purpose that the book should be comprehensible to the average man who uses the appliances described—the miner, the fireman, the airman, and all those who have to work in dangerous atmospheres. That the very learned may seek something more profound is understandable, but if I have succeeded in giving, in simple language, something interesting and instructive to these users of breathing appliances, I am content. The generous notices and letters I have received lead me to believe that I have not been altogether unsuccessful.

Reference is made to the omission of war-time developments and to "cursory mention" of diving appliances and related problems of oxygen-poisoning and the use of helium. A cursory glance at the dust cover would

have told the reviewer that the book excluded diving problems. War-time developments in breathing appliances were largely confined to underwater apparatus, and these I am dealing with in a revised edition of *Deep Diving and Submarine Operations*. Within the scope of *Breathing in Irrespirable Atmospheres* I included the latest types of oxygen regulators used in aircraft in the recent war.

Stebe, Gorman and Co. Ltd.,  
Tolworth, Surrey.

ROBERT H. DAVIS.

#### ANTICOAGULANT THERAPY

SIR,—I write to draw attention to the danger of following advice given in your leading article of April 17.

Commenting on hæmorrhage following excessive administration of dicoumarol, you state: "For the serious hæmorrhages 60 mg. of menaphthone (synthetic vitamin K) is given *intravenously* 2-hourly for 1-3 doses." Menaphthone is insoluble in water but is soluble in fixed oils, and the British Pharmaceutical Codex<sup>1</sup> says: "Solutions for injection may be prepared by dissolving menaphthone in arachis oil or other suitable vegetable oil." Therefore, if your readers wish to give vitamin K intravenously, they should not use menaphthone, the oily solution of which is intended for intramuscular injection.

The reference to the administration of 60 mg. of synthetic vitamin K is obviously taken from Allen,<sup>2</sup> but in his article a water-soluble vitamin-K analogue is recommended. Water-soluble analogues of vitamin K can be given by any route with perfect safety and have much to commend them, but I should regard the 60 mg. advised by Allen as the minimum dosage.

Welwyn Garden City.

F. WRIGLEY.

\*\* We are indebted to Dr. Wrigley for pointing out our error. The preparation to which we intended to refer was the sodium salt of menaphthone. This water-soluble vitamin-K analogue, which has no official name, is sold by Roche Products Ltd. under the name 'Synkavit.'—ED. L.

### Parliament

#### FROM THE PRESS GALLERY

#### Lords and the Death Penalty

IN the House of Lords on April 27, in moving the second reading of the Criminal Justice Bill, Viscount JOWITT, the Lord Chancellor, admitted that he was in a somewhat embarrassing position about the abolition of the death penalty. He was not personally in favour of the proposed change. Hanging was a grim and horrible business, but so was murder. He believed that capital punishment was a deterrent but he realised it was inexpedient to use a penalty which was repugnant to a large section of public opinion. As he had agreed to the matter being left to a free vote, he now felt that he must rely on that decision.

Lord SAMUEL suggested that what was needed was not the abolition of the death penalty, but more discrimination in its application by extending the powers of the Home Secretary to reprieve.

The Bishop of WINCHESTER urged that in thinking about the death penalty, one should beware lest the almost pathological fear of punishment in almost any form, which was so common today, clouded judgment. He felt that perhaps this Bill was a little infected at some points by an excessive fear of punishment. He certainly viewed with some alarm the extent to which the door was opened to the opinions and influence of more medical men and more psychiatrists.

Opening the second day's debate Lord TEMPLEWOOD urged that not even a murderer should be abandoned as beyond hope. He felt profoundly the need for this country in a brutal and disillusioned world to show respect for the sanctity of human life. At the same time, he regretted that the question of the death penalty had not been dealt with in a separate Bill.

Lord SALISBURY, as leader of the Opposition peers, expressed the hope that the Government would not

1. *British Pharmaceutical Codex*, 3rd suppl., London, 1942; p. 37.  
2. Allen, E. V., et al. *Ann. intern. med.* 1947, 27, 371.

allow this question to become an issue between the two Houses. The decision in the House of Commons did not, he held, bind their Lordship's House. In replying to the debate the LORD CHANCELLOR agreed that, though he was personally prepared to stand by the free vote in the Commons, the House of Lords as a whole had constitutionally a perfect right to send the matter back to the Commons for consideration. The Bill was read a second time without a division. The House of Lords will begin the committee debate on the Bill on June 1 when the clause abolishing the death penalty will be once more considered.

#### Scottish Air Ambulance Services

In the House of Lords on April 27 Lord NATHAN, Minister of Civil Aviation, replying to questions by Lord FAIRFAX of CAMERON and Lord POLWARTH, said that the Department of Health for Scotland would assume responsibility for these services on July 5, when the National Health Service came into operation. Lord Nathan added that neither the corporations nor he had statutory obligations to provide ambulance services, but as part of the general policy of the Government to develop social services in the public interest he was taking all possible measures, in coöperation with the Health Departments, to secure the provision by British European Airways of adequate services to the islands off the coast of Britain. Services were at present available to Islay, Tiree, Barra, Benbecula, Stornoway, Orkney and Shetlands, South Harris, North Uist, Isle of Man, Scilly Isles, Alderney, Jersey, and Guernsey. Consideration was being given to the extension of the facility to the islands of Mull, Cole, Colonsay, Fair Isle, and Foula. Ambulances could be summoned by telephone or telegraph by any doctor whose name was included in the list supplied to the Corporation by the Department of Health for Scotland, in conjunction with the Scottish county councils concerned.

#### QUESTION TIME

##### Joining the National Health Service

Sir ERNEST GRAHAM-LITTLE asked the Minister of Health what would be the position as regards penalties by fine or otherwise, of insurable persons who declined to register under the new Act, and preferred to continue to receive medical attention from independent doctors; what would be the position of persons who, having registered, found that health services specified under the Act were not provided in the area in which they lived; and whether such persons would be called upon to pay for services which they could not, in fact, enjoy.—Mr. ANEUBIN BEVAN replied: The new health service is not based on insurability, and anyone can use it or not, as they wish, at any time. What is available in each area at any time will depend on resources, but—as the great part of the cost of the service is from taxes and rates—people cannot be paying for something that is not available.

Sir HENRY MORRIS-JONES asked the Minister what guidance he was giving allocation committees which were to be set up under the National Health Service Act in regard to all persons who were entitled to medical treatment but who had not selected a doctor and who might not wish to avail themselves of treatment as insured persons.—Mr. BEVAN replied: The benefits of the National Health Service are not dependent on insurance qualifications. Allocation committees will deal only with persons who ask to be allocated.

Mr. L. D. GAMMANS asked the Minister why the public was asked to choose their doctor now under the National Health scheme when it would not be known until July 5 which doctors had decided to enter the scheme.—Mr. BEVAN replied: The full list of doctors entering the scheme will not of course be known until July 5, but some are already doing so. In any case doctors' lists of patients should be made up before the scheme starts, so that individual doctors may settle for whom they will be responsible and may be remunerated for the full number from the start, and patients may have a doctor ready to look after them.

##### Available Beds

Sir ERNEST GRAHAM-LITTLE asked the Minister how many hospital beds in England and Wales would be available on the appointed day, as compared with the number in 1938.—Mr. BEVAN replied: The total number of beds in England and Wales at the end of 1947, the latest date for which information

is available, was 533,000. The corresponding figure for 1938 so far as is known was 466,000.

#### Alien Doctors and Registration

Lady GRANT asked the Minister of Health whether foreign practitioners serving under the Crown in the Colonial Medical Service were to be allowed to apply for permanent registration under the Medical Practitioners and Pharmacists Act, 1947, although not resident in the United Kingdom.—Mr. BEVAN replied: Registration is conditional on residence in the United Kingdom and these practitioners cannot be registered under the Act while serving abroad. If they subsequently take up residence it is open to them to apply.

#### Accommodation for Mentally Defective Children

Mr. ANTHONY GREENWOOD asked the Minister what representations he had received from the Lancashire county council as to the urgent need for providing proper institutional treatment for mentally defective children at present in public-assistance mental wards; and how many such children were so placed in Lancashire.—Mr. BEVAN replied: The council has expressed concern that a number of these children have still to be cared for in the mental and general wards of these institutions, and every effort has been—and is being—made to transfer them to specialised institutions. Inquiry last year showed 156 children so situated, of whom, so far, 17 have been able to be moved to mental-deficiency institutions.

### Obituary

#### HARRY STOBIE

F.R.C.S., F.D.S.

Prof. Harry Stobie, dean and director of studies at the Royal Dental Hospital, London, where he also held the chair of dental surgery and pathology, died at his home in Sutton on April 27, at the age of 65.

Born in Liverpool, he spent his early years in South Africa, and he came to the Royal Dental Hospital at a rather later age than most. Beginning with an entrance scholarship he took many class prizes. After taking his dental qualification in 1910, he completed his medical studies at St. Thomas's Hospital and obtained the Conjoint qualification the following year.

Soon after qualifying he was caught up in the 1914-18 war, during which he served in the R.A.M.C. as an assistant to Sir Frank Colyer who was in charge of the unit for wounds and injuries of the jaw at the Croydon General Hospital. Here Stobie spent the whole of his service, gaining great insight into the varieties and treatment of these injuries. In 1915 he was appointed assistant dental surgeon at the Royal Dental Hospital, and in 1930 to the part-time posts of surgeon, dean and director of teaching, and lecturer in dental surgery and pathology.

Stobie had a busy and full professional life. From 1932 to 1936 he was also post-graduate instructor in oral surgery at the hospital, and he examined in dental surgery for the Royal College of Surgeons of England, and the universities of London, Birmingham, and Bristol. He served first as a member of council, and then for some years as a vice-president, of the Medical Protection Society, and was at one time president of the metropolitan branch of the British Dental Association. He was also a former president of the odontological section of the Royal Society of Medicine, and was a member of the board of studies in dentistry of the University of London.

After spending some years in private practice Stobie took up the academic side of his work, and in 1939 he was appointed to the first chair in dental surgery to be created at the school. Unfortunately, however, his opportunities for personal research were almost immediately interrupted by the war, and his energies were largely occupied in fulfilling arduous tasks as consulting



[Photopress

dental surgeon to the Army, in which he received the rank of brigadier. During the war he was elected to the fellowship of the Royal College of Surgeons, an honour of which he was very proud, and last year he became a foundation fellow in dental surgery of the college, serving on the newly formed faculty of dentistry.

Prof. Evelyn Sprawson, to whom we are indebted for much of this memoir, writes: "Stobie's was a genial and likeable personality, though he was of a retiring disposition. A staunch friend, he was intensely loyal and conscientious in all he undertook. Given the facts of a case, his opinion on its possible outcome was always a very sound one and to be valued accordingly. This was perhaps particularly well seen in dental cases where there was a possibility of subsequent legal action. I shall miss his presence at the council and committee meetings we attended together over many years."

Professor Stobie married in 1912 Emmeline Mary, daughter of F. M. Guanzioli. She survives him with two sons, one of whom took his L.D.S. in 1940.

**CHARLES SHACKLETON SIMPSON**

M.R.C.S.

Dr. C. S. Simpson died on April 21 at Southwick, where he had spent the last 17 years after retiring from his practice at Hove. He was born in 1861 in Brighton, where his father had designed much fine property. Two of his brothers were also architects, and one (Sir John Simpson, P.R.I.B.A.) designed Wembley Exhibition and Roedean School. A third brother, Graham Scales Simpson, was professor of surgery at Sheffield. From Brighton Grammar School he went to Guy's where he qualified in 1889, and after holding some junior appointments he settled in Hove where he practised for 40 years.

A colleague writes: "Simpson gave unfailing courtesy, kindness, and consideration, and had a quiet peaceful bedside manner together with a keen sense of humour. He refused to argue or get ruffled, thus preserving a peace of mind which he loved. Rush and hurry were foreign to him, though he always had time for everything. A keen naturalist, ornithologist, and amateur photographer, he was also a great reader and he possessed a magnificent library of gramophone records. With a broad tolerance and understanding of new ideas and youth, he had that practical knowledge of clinical medicine which the newly fledged, however well qualified, need so badly and take so long to acquire."

Dr. Simpson leaves a widow and two daughters.

**DR. GUTTMANN**

Dr. W. Mayer-Gross writes: Working with Eric Guttman on a scientific problem was an experience as enchanting personally as it was stimulating intellectually. He was the perfect listener and rarely made some critical remark, mostly with a friendly touch of irony. When his turn came, he seemed to have everything ready: with ease and elegance, he disentangled the whole problem, disclosing an astounding wealth of knowledge in literature and methods and—of course—constructive ideas for a solution. It came from him so naturally and he claimed so little for himself that many did not realise his high abilities. He, therefore, never lacked collaborators, either in his earlier days in Germany, or after his forced emigration to this country. He liked the unassuming, anonymous ways of clinicians here in working out and publishing their results as compared with the wordy publicity of scientists in Germany. In many other respects he felt at home in England and refused tempting invitations to the United States. He was too sensitive to play the rôle of a perfect refugee; but after he had overcome the disappointment of a short internment in 1940, he settled down to life in London which suited him perfectly. He loved London, its cosmopolitan life, its pubs, cinemas, little suburban music-halls, and the cockney. To hear him examining one of his professional boxer friends for signs of punch drunkenness—one of his approaches to the problem of head injury—was equally enjoyable and instructive. He was less happy in war-time Oxford where, working at the Radcliffe and St. Hugh's, he collected the material for his studies on headache and reablement of closed head injuries, probably his most important work since he came to Britain. Guttman's most valuable contributions to

British psychiatry were, however, not in print. The late R. D. Gillespie relied largely on his counsel when planning the York Clinic at Guy's Hospital; Professor Mapother held a very high opinion of his ability as an organiser of teaching and research. He especially appreciated Guttman's personal courage and good humour in discussions and controversies. These qualities he preserved to the last. When, after an acute attack of asphyxia due to congestive heart-failure, he was transferred to the Hammersmith Hospital, he wrote in a letter: "... at least and at last I'll acquire the dignity of a well investigated professorial case."

We learn with regret that Dr. JOHN H. HANNAN died on April 7. A letter from him on Overcompensation in Disablement was published in our issue of April 24.

**Public Health**

**Epidemic Nausea**

A "mystery disease" has recently been mentioned in the popular press as occurring in several parts of the country, particularly at Okehampton. Clinical accounts received correspond with the features of "epidemic nausea and vomiting" described by W. H. Bradley<sup>1</sup> in 1943. The outbreaks are few and widely scattered. They do not amount to an epidemic.

**Manufacture of Ice-cream**

Under the Ice Cream (Heat Treatment) Regulations, 1947, manufacturers are required to cool ice-cream mixture to a temperature of not more than 45°C within 1½ hours of heat treatment, and to keep it at such a temperature until the mixture is frozen. Owing to the difficulty of obtaining cooling apparatus the Ministers of Health and Food provided last year that where manufacturers could show they had ordered and been unable to obtain cooling apparatus they should not be penalised under this section of the regulations. Similar provision, for the twelve months beginning on May 1 this year, is made in the Ice Cream (Heat Treatment, &c.) Amendment Regulations, 1948.

**Deaths in 1947**

The Registrar-General announces<sup>2</sup> the following provisional death-rates per million population for England and Wales during 1947:

	Males	Females	Persons
Respiratory tuberculosis ..	593	362	470
Other tuberculosis ..	87	72	79
Cancer ..	1976	1745	1853

The maternal mortality (provisional) per 1000 total births, based on deaths primarily classed to diseases of pregnancy, childbirth, and the puerperium was as follows:

Postabortive infection ..	0.10
Abortion without mention of septic conditions ..	0.06
Infection during childbirth and the puerperium ..	0.16
Other maternal causes ..	0.85

- Bradley, W. H. *Brit. med. J.* 1943, 1, 309
- The Registrar-General's Weekly Return of Births, Deaths, and Infectious Diseases for the week ended April 24. H.M. Stationery Office. 6d.

**Notifications of Infectious Diseases**

ENGLAND AND WALES

Disease	Week ended April			
	3	10	17	24
Cerebrospinal fever ..	51	36	47	43
Cholera ..	..	..	..	1*
Diphtheria ..	161	155	136	179
Dysentery ..	188	111	110	252
Encephalitis lethargica ..	1	..	..	..
Measles, excluding rubella ..	10,874	11,193	9681	9092
Ophthalmia neonatorum ..	72	65	54	52
Paratyphoid fever ..	1	3	7	3
Pneumonia, primary or influenzal ..	764	703	639	593
Polioencephalitis ..	4	2	1	2
Poliomyelitis ..	15	14	19	16
Puerperal pyrexia ..	123	135	114	131
Scarlet fever ..	1421	1196	1290	1535
Smallpox ..	..	..	..	..
Typhoid fever ..	5	7	9	4
Whooping-cough ..	2639	3303	3888	3727

\* Laboratory infection

## Notes and News

### BRITISH JOURNAL OF PLASTIC SURGERY

The appearance of this journal, the official organ of the British Association of Plastic Surgeons, marks the first anniversary of the founding of the association. In an article on plastic surgery in the training of a surgeon Prof. J. Paterson Ross points the way for the future development of all specialties: "unless," he says, "special centres are grouped together in a hospital unit which is closely linked to an undergraduate teaching hospital, neither plastic surgery nor any of the other specialties can make its full contribution to the training of specialists or of general surgeons."

Mr. A. B. Wallace, the editor, and his editorial committee, hope the journal will help to bind British and Dominion plastic surgeons into a team, and this first issue begins the good work. Six excellent short articles on plastic surgery are written by three New Zealand, one South African, and two British-born surgeons. Sir Harold Gillies and Dr. R. J. Harrison open with a paper on congenital absence of the penis. This highly specialised contribution illustrates Sir Harold's unequalled skill in the handling of skin flaps. Sir Archibald McIndoe's clear account of deformities of the male urethra will be read by a wide surgical public. Mr. Rainsford Mowlem presents the treatment of lymphoedema—a controversial subject—in a concise and dogmatic manner. His plan for the employment of flaps is based on the assumption that the larger lymphatic trunks are provided with valves; yet results are sufficiently disappointing to raise doubts on this point, and more details of his plan in lymphoedema of the arm and of the dimensions of his flaps generally would help those wishing to confirm his work. He is to be congratulated on tackling a crippling condition on pioneer lines. Mr. James B. Cuthbert and Mr. F. T. Moore write well on pollicisation of the index finger, and Mr. Michael C. Oldfield concludes with an interesting procedure for the treatment of syndactyly.

This new journal, well produced and freely illustrated, marks a stage in the development of plastic surgery of which the editor and his committee, as well as Sir Harold Gillies—who has worked hard for recognition of the specialty—may be proud. The new president of the association is Prof. T. Pomfret Kilner.

### LEGAL COMMITTEE ON PARTNERSHIPS

THE legal committee set up by the Minister of Health<sup>1</sup> to consider the disputed effect of the National Health Service Act on partnership agreements will be prepared to receive evidence from any organisation or persons directly interested. It is requested that those wishing to place their views before the committee should submit memoranda to the Secretary of the Committee, Ministry of Health, Whitehall, London, S.W.1, as soon as possible, and in any case before the end of May. The committee comprises:

Mr. G. O. Slade, K.C. (chairman), Mr. Colin Pearson, Mr. J. R. Phillip, K.C., Sir Cyril Radcliffe, K.C., and Mr. J. H. Stamp.

### SOCIALIST MEDICAL ASSOCIATION

THE 18th annual meeting of this association, held in London last weekend, was attended by over 100 doctors and health workers.

Mr. Somerville Hastings, M.P., the president, suggested that in the coming year the main work of the association should be to gain public support for the National Health Service. Dr. D. Stark Murray, moving a resolution of general support for the Minister of Health, said he believed that the Minister's recent concessions had not imperilled any of the principles of the Act. Dr. H. H. Joules declared that if the building situation became any easier, priority should be given to health centres and to hospitals. He insisted that pay-beds in hospitals should not be permitted while waiting-lists were of their present length.

A vigorous plea was made for the introduction of an appointment system in outpatient departments, and the Minister was asked to make this compulsory. He was also urged to withdraw his circular 3/48, on health centres. Other resolutions urged the recruitment of nurses into trade unions, and called for the setting up of a Working Party to inquire into the drug and chemical industries. The meeting expressed its serious concern at the numbers of doctors in the Services, and decided to approach the Medical Priorities Committee

and the Ministers concerned with a view to revision of the doctor-personnel ratios. Finally, the meeting deplored the fact that prices are rising while wages are frozen, and expressed concern with the decision of the Government to eliminate persons from the Civil Service on the ground of their political opinions.

The officers for 1947-48 will be: president, Mr. Somerville Hastings; vice-presidents, Dr. Joules and Dr. Stark Murray; hon. secretary, Dr. D. E. Bunbury; treasurer, Dr. L. T. Hilliard.

### SPECIAL ISSUE OF DRIED MILK

THE Minister of Food has arranged for half-cream national dried milk to be supplied to patients suffering from steatorrhoea, coeliac disease, or tropical sprue, instead of the machine-skimmed sweetened condensed milk at present allowed. The amount allowed will be one 20-oz. tin per week, obtainable at 3s. per tin from the local food office.

### A CENTURY OF PUBLIC HEALTH

THE Health of the People Exhibition, which opened in London this week, marks the centenary of the first Public Health Act. From the realistic reproduction of a cellar slum of a hundred years ago the visitor turns with gratitude to the effigies of the nineteenth-century giants who gave us the better-ordered present, depicted in a series of displays ranging from mass radiography to blood-transfusion. But what of the future? A press-button quiz on the National Health Service should provide amazed enlightenment to the many who continue in ignorance of even its broad provisions. The Central Office of Information, which devised this exhibition for the Ministry of Health, might well illustrate in greater detail the implications of the legislation which comes into force on July 5. Such exhibitions are among the most powerful weapons of instruction and propaganda; but ordinarily they are seen only by the city-dweller. The present one, for example, will remain at Mount Royal, Oxford Street, until June 5, after which part of it will go to some half-dozen provincial centres. Could not a humbler display be devised and duplicated and sent to the smaller towns and villages, to bring home the nature of the new social order? The lively curiosity about the new measures is not to be satisfied by pamphlets; and the fact that an important section of the popular Beveridge recommendations is now to be implemented is not yet widely recognised. Only full understanding will ensure willing and intelligent participation.

### FILM STRIP ON THREADWORM DIAGNOSIS

Two good methods of collecting threadworm ova for microscopical examination—(1) with adhesive 'Cellophane' tape, and (2) with a glass pestle—are clearly illustrated, with descriptive lecture notes, in an 18-frame film strip issued in 18 × 24 mm. (ciné frame) or 24 × 36 mm. (double frame) by Unicorn Head Film Strip Library, 177, The Vale, Acton, London, W.3. The illustrations can also be supplied as photographic prints (3<sup>1</sup>/<sub>4</sub> × 4<sup>1</sup>/<sub>2</sub> in. or 6<sup>1</sup>/<sub>2</sub> × 8<sup>1</sup>/<sub>2</sub> in.).

### University of Cambridge

Field-Marshal Smuts will be installed as chancellor in June and will afterwards confer honorary degrees. On May 15 the senate will be asked to agree that the honorary doctors of science shall include Sir Wilson Jameson, Sir Hugh Lett, and Sir Paul Fildes, F.R.S.

### University of London

The British Postgraduate Medical Federation has awarded postgraduate travelling fellowships for 1948-49 to Mr. J. B. Kinmonth (surgery, U.S.A. and Sweden), Dr. H. V. Morgan (medicine, Canada and U.S.A.), Dr. J. P. Quilliam (physiology, U.S.A.), and Dr. W. Somerville (cardiology, U.S.A. and Sweden).

### Tuberculosis Association

The annual conference will be held at the Queen's University, Belfast, from June 30 to July 2. The speakers will include Dr. Brice Clarke, Prof. Arvid Wallgren, Dr. Dorothy Price, Dr. Robert Marshall, Prof. Jorgen Lehmann, Dr. T. G. Dempsey, Dr. A. F. Foster-Carter, Dr. Dillwyn Thomas, Mr. J. H. Carver, Dr. Johann Gravesen, Dr. Joseph Smart, Mr. W. P. Cleland, Dr. James Deeny, Dr. Johannes Holm, and Dr. J. E. Wolf. An ordinary meeting will be held at the Queen Elizabeth Hospital, Birmingham, on Friday, May 21, at 2.30 P.M.

1. See *Lancet*, April 17, p. 617.



**Royal College of Physicians of London**

At a meeting of the college held on April 29, with Lord Moran, the president, in the chair, the following were elected to the fellowship:

PERCY STOKES, London; F. F. TISDALL, Canada; H. L. HELMANN, South Africa; H. S. MORLEY, Sussex; G. E. F. SUTTON, Bristol; K. B. NOAD, Australia; C. A. KEELE, London; F. C. GOLDING, London; W. H. MCMENEMY, Worcester; J. E. CAUGHY, New Zealand; C. H. FITTS, Australia; WILLIAM PHILLIPS, Wales; URSULA SHELLEY, London; N. LLOYD RUSBY, London; IBRAHIM SHAWKI, Cairo; F. R. BETTLEY, London; J. E. DEBONO, Malta; M. J. F. MCARDLE, London; C. G. BAKER, London; T. R. C. FRASER, London; C. J. GAVEY, London; A. L. BANKS, London; K. M. A. PERRY, London; Brigadier JOHN BENNETT, London; J. S. RICHARDSON, London; N. S. ALCOCK, Truro; H. T. HOWAT, Manchester; F. A. ELLIOT, London; J. F. DOW, London; K. A. LATTER, Norwich; RAYMOND LEWTHWAITE, o.B.E., Malaya; G. W. M. FINDLAY, C.B.E., London; A. R. D. ADAMS, Liverpool; A. M. JONES, Manchester; DOROTHY S. RUSSELL, London; D. M. DUNLOP, Edinburgh.

Dr. C. A. Keele and Dr. K. Robson were elected examiners for the diploma in anaesthetics under the new regulations, and Dr. G. E. S. Ward was elected external examiner for the faculty of radiologists. Dr. Helen M. M. Mackay was appointed representative to attend the Annual Conference of Maternity and Child Welfare, from June 23 to 25.

A report of the Propit Tuberculosis Survey was received. The following, having satisfied the censors' board, were elected to the membership:

R. H. Andrews, M.B. Lond., S. T. Anning, M.D. Camb., C. E. Astley, M.D. Leeds, E. H. Back, M.B. Camb., A. J. Bailey, M.B. Sheff., Dehabrata Banerji, M.B. Calcutta, R. G. G. Barry, M.D. N.U.I., N. O. Begg, M.B. N.Z., J. N. Berry, M.D. Punjab, M. C. Binnie, M.B. Birm., L. G. Blair, L.R.C.P., D. J. Brennan, M.B. Sydney, E. J. S. N. Briggs, M.B. Lond., D. B. Buckley, M.D. N.U.I., J. S. Calnan, L.R.C.P., E. F. Carr, M.B. Camb., L. W. Carstairs, M.B. Durh., J. R. Carter, M.B. Lond., T. M. Chalmers, M.B. Edin., R. B. Coles, M.B. Lond., N. F. Crofts, M.B. Camb., P. G. Dalgleish, M.B. Lond., F. J. Davidson, M.B. Witwrsand, J. H. Deakin, M.B. Sydney, J. T. M. De Villiers, M.B. Witwrsand, John Donnellan, M.B. Lpool, R. G. Dreadon, M.B. N.Z., B. K. Ellenbogen, M.B. Lpool, F. P. Ellis, M.D. Manc., surgeon-commander r.n., Benjamin Epstein, M.B. Witwrsand, J. W. Fawcett, M.B. Camb., Charlotte Feldman, M.B. Leeds, Derrick Foskett, M.B. Camb., J. H. Gear, M.B. Witwrsand, J. A. Glover, M.B. Camb., R. R. Gordon, M.B. Glasg., A. A. Guild, M.B. Edin., A. H. M. Halim, Diploma Kitchener School Med., J. D. L. Hansen, M.B. Cape Town, J. H. S. Heller, M.B. Camb., A. G. Hesling, M.B. Lond., Don Hilson, L.R.C.P., F. W. B. Hurlburt, M.D. Toronto, R. E. Irvine, M.B. Camb., James Ibbister, M.B. Sydney, F. S. Jackson, M.B. Camb., J. H. Jacobs, M.B. Camb., Solomon Jacobson, M.B. Witwrsand, H. R. Jolly, M.B. Camb., E. O. W. Jones, L.R.C.P., J. W. Jordan, M.B. Lond., S. I. Kaye, M.D. Lond., W. E. King, M.D. Melb., Robert Kirk, M.D. Glasg. (in absentia), P. O. Leggat, M.B. Aberd., V. M. Leveauux, M.B. Lond., R. D. K. Levy, B.M. Oxid., T. R. Littler, M.B. Lpool, D. L. Lloyd-Smith, M.D. McGill, John Lorber, M.B. Camb., David Lurie, M.B. Cape Town, Vivion U. Lutwyche, M.B. Camb., B. E. McConnell, M.B. Beif., Robert Macpherson, M.B. Lond., Donald Macrae, M.B. Glasg., John Marks, M.B. Lond., Robert Marshall, M.B. Camb., David Micklewright, B.M. Oxid., Alison M. Miles, B.M. Oxid., J. P. D. Mounsey, M.B. Camb., G. A. Newsholme, M.B. Camb., G. D. Owen, M.D. Lpool, W. J. Penman, M.B. Lond., E. J. T. Frettejohn, M.B. Camb., E. D. Puffett, M.B. Sydney, J. F. P. Quinton, M.B. Camb., C. S. Rennie, M.B. Manitoba, J. M. Rice-Oxley, B.M. Oxid., M. J. Riddell, M.B. Lond., F. L. Ritchie, M.B. Sydney, L. M. Rose, B.M. Oxid., F. D. Rosenthal, M.B. Lond., N. J. Roussak, M.B. Manc., Elias Sanders, M.B. Cape Town, T. R. Savage, B.M. Oxid., Daphne M. Scott, M.B. St. And., V. V. Shah, M.D. Bombay, James Sharp, M.B. Manc., G. M. Shy, M.D. Oregon, C. P. Silver, B.M. Oxid., Daphne Smith, M.B. Durh., I. O. B. Spencer, M.B. Durh., D. G. H. Stone, M.B. Lond., G. O. Storey, M.B. Camb., W. S. Sufern, M.D. Leeds, G. F. Swann, M.B. Lond., P. N. Swift, L.R.C.P., W. K. Taylor, L.R.C.P., Raphael Tepper, M.B. Manc., J. W. Thompson, M.D. Lond., J. J. Tillie, M.B. Glasg., R. H. Townshend, M.B. Manc., R. S. Weetch, M.B. Glasg., H. N. B. Wettenhall, M.D. Melb., L. A. Wilson, M.B. Aberd., P. A. O. Wilson, M.B. Camb., G. E. Wodehouse, M.D. Toronto, O. H. Wolf, M.B. Camb., C. J. Zerny, M.B. Lond., Fred. Zlady, M.D. Pretoria.

Licences to practise were conferred upon the candidates named in the report of the meeting of the Royal College of Surgeons.

Diplomas were granted to those named in this issue and in our issue of April 24 in reports of the meetings of the Royal College of Surgeons. The following diplomas were also granted:

D.C.H.—H. S. de Silva.  
D.T.M. & H.—M. S. Holman.  
D.P.H.—A. W. Mearns.

**Superannuation in the National Health Service**

The Ministry of Health is arranging for the issue of an explanatory booklet<sup>1</sup> to the 300,000 or so who are eligible to take part in the superannuation scheme under the National Health Service.

1. Superannuation Scheme for those engaged in the National Health Service: an Explanation. H.M. Stationery Office, 1948. Pp. 30. 3d.

**Royal College of Surgeons of England**

At a meeting of the council held on April 28, with Sir Alfred Webb-Johnson, the president, in the chair, Prof. Brian Windeyer was coopted as a representative of radiology.

Diplomas of membership were granted to the following:

J. A. S. Amos, J. A. Archer-Hall, Marion M. Ashforth, Frank Ashton, G. D. Banyard, Somnath Basu, Phyllis M. Batchelor, Josephine Batey, S. J. Beales, R. L. Bell, R. C. T. Bellamy, M. J. Bhavnani, Julian Bihari, M. D. M. Bowen, Jean M. Boyd, H. E. Braun, R. H. Brayshaw, H. C. Brown, France Brun, W. W. Bryett, J. D. Bury, P. O. G. Butler, Cicely I. Butterworth, John Caisley, Joan M. China, P. H. Coldwell, P. C. Conlon, Leopold Coueslant, Christian R. Cumming, Peter Darby, F. J. Davis, L. R. Davis, E. L. Dawe, J. V. Deakin, P. F. Doherty, M. J. F. Donovan, P. H. Drake, V. G. Edwards, Mary M. Elias, Sylvia C. Ellison, Philip Freedman, D. E. I. Friedman, L. K. Garstin, Annie I. M. A. Gregory, I. W. de G. Gregory, J. A. Griffiths, Barbara G. Grime, R. L. Grynnoch, Eve Hammer, J. J. Handler, Betty P. Harris, F. C. Harris, H. W. L. Harrison, W. J. Hatton, C. E. D. Hearn, Cherry D. Heath, J. D. Helghway, P. G. Hill, J. E. Jacques, D. A. James, Nancy C. James, J. S. Jenkins, Joan E. Jermy, Daphne G. Jones, Norman Kennedy, Catharine E. Large, G. N. Lumb, Flora Macdonald, E. L. Magee, Joan Marshall, Elizabeth A. Martin, G. C. Mathers, Anne D. Mellor, G. R. J. Moodie, A. D. Moore, H. S. Moore, D. J. R. Morgan, B. J. L. Moss, Elizabeth M. W. Mostyn, T. O. W. Myrddin-Evans, J. F. Nunn, R. H. P. Oliver, D. S. Parken, M. S. N. Pathy, Wallace Peters, G. W. Piper, K. A. Porter, Jean M. Randall, S. K. Ray, P. A. Read, Allison D. Reid, H. R. C. Riches, D. W. T. Roberts, John Roper, L. J. Rubinstein, Leon Russell, Pamela D. Rustin, J. J. T. Ryan, David Sacks, D. E. G. Sayers, B. U. F. R. Seneviratne, R. G. Shorter, A. K. Siddiqui, B. J. Silkoff, J. A. Slattery, P. J. D. Snow, Jean P. Spalding, Betty J. Handford, Werner Stern, D. C. Stevenson, Mary L. Stokes, C. M. Sutherland, C. G. W. Sykes, Anita J. Thomas, E. T. Thomas, Mary E. Tomlinson, D. G. H. Tutton, Keth Tuxford, G. D. Tweedy, Anthony E. P. Twort, P. S. Vassar, Kathleen E. Wallace, R. W. Wallis, P. D. Warren, G. H. Warrick, H. J. C. Watson, R. J. A. Webb, L. J. Wood, V. P. Wordsworth, John Zamler.

Diplomas in physical medicine were granted, jointly with the Royal College of Physicians, to the following:

B. E. Brocks, I. H. M. Curwen, W. F. Dunham, F. B. Edmundson, E. F. Mason, N. R. W. Simpson.

**Pathological Society of Great Britain and Ireland**

The meeting of the society, which had provisionally been arranged to take place in Ghent on July 9 and 10, has had to be cancelled owing to currency restrictions. The meeting will now be held in the Medical School, Leeds, on the same dates.

**Students' Payments under National Insurance**

All students aged 18 and over will become liable to pay weekly contributions, at the rate of 4s. 8d. for a man and 3s. 8d. for a woman, when the new National Insurance scheme comes into force on July 5; but those whose total income does not exceed £104 a year can claim exemption.

**Royal Medical Foundation of Epsom College**

Applications are invited for a Christie pension.

Doctors of not less than 55 years of age, who have been registered for at least 5 years, are eligible for this pension (£89 p.a.). Other pensions and grants are also available for doctors, their widows and spinster daughters, as well as scholarships, exhibitions, and grants for children of public-school age. Forms of application may be obtained from the secretary's office, Epsom College, Surrey.

**Ministry of Health**

Dr. Leslie Housden has been appointed a part-time adviser to the Ministry on the establishment and development of schemes for teaching parentcraft.

**Animal Reproduction and Artificial Insemination**

Twenty-one nations have so far accepted invitations to send representatives to the First International Congress of Physiology and Pathology of Animal Reproduction and of Artificial Insemination, to be held in Italy this summer. The secretary-general of the congress, which opens on June 21, is Prof. T. Bonadonna, Milan, via Bronzetti 17.

**Retirement from the L.C.C. Service**

Dr. A. M. Hewat, a principal medical officer in the London County Council's public-health department, is retiring owing to ill health.

Dr. Hewat was medical officer of health for Fulham before his appointment in 1926 as a senior medical officer in the L.C.C. service. He took charge of the department dealing with tuberculosis, venereal diseases, midwifery, and foster children; and he was largely responsible for the delicate and difficult task of implementing the council's duties under the Nursing Homes' Registration Act, 1927. In 1933 Dr. Hewat's duties were increased to embrace the environmental hygiene work associated with the London programme of slum clearance, the administrative control of the chemical branch, and the work of the sanitary inspectors. Since his promotion in 1941 to principal medical officer he has also been concerned with the administration of the school health service; and he thus had to deal with the complex problems arising from the war-time evacuation of the school population to the provinces, and more recently in connexion with changes under the 1944 Education Act.

**Oliver Fund Award**

The Oliver Memorial Fund award of £50 for original work on blood-transfusion has been given to Dr. R. R. Race for his researches into blood-groups. A similar award will be offered next year.

**Royal Appointments**

Surgeon Rear-Admiral L. F. Strugnell has been appointed honorary physician to the King in place of the late Admiral C. M. Beadnell, and Surgeon Captain J. F. M. Campbell in place of Surgeon Rear-Admiral A. E. Malone who has retired.

**British Red Cross Society**

Air Commodore H. A. Hewat has been appointed medical adviser to the society.

Air Commodore Hewat, who is 59, was educated at Loretto and the University of Edinburgh where he graduated M.B. with honours in 1915. He has served in all the three Services at home and abroad, and from 1938 to 1940 he was principal medical officer to British Forces in Iraq. From then till he retired in 1945 he served with Flying Training Command. He was appointed C.B.E. in 1943.

**Current Medical Periodicals**

A union catalogue of the current medical periodicals in five large medical libraries in London has been compiled by the librarians of the British Medical Association, the London School of Hygiene and Tropical Medicine, the Medical Research Council, the Royal College of Surgeons of England, and the medical sciences library at University College. A set of the cards, which will be kept up to date, has been deposited at each of these libraries and at the Royal Society of Medicine, the National Central Library, and the British Union Catalogue of Periodicals (British Museum). The work was made possible by a grant from the Medical Research Council.

Mr. A. E. Porritt is to visit Hungary to lecture on behalf of the British Council between May 16 and 29.

A booklet reviewing the properties and clinical applications of penicillin has been published by Imperial Chemical (Pharmaceuticals) Ltd., Alderley Edge, Manchester.

A report of the conference on food and drink infections, held in London last October by the Central Council for Health Education, has now been published. The report, price 4s., is obtainable from the council's headquarters at Tavistock House, Tavistock Square, London, W.C.1.

**CORRIGENDA:** *For and Against Myanesis.*—In printing Dr. Loftus Dale's letter of April 24 we misread a comma and introduced an error. His series included three (not two) cases of venous thrombosis—two minor and one very serious.

**Marriage Guidance Council.**—In the letter from the chairman and secretary of the medical committee in our issue of April 17 the address of the council should have been given as 78, Duke Street, London, W.1.

**Appointments**

- ALLEN, LETITIA, M.B. Belf., D.P.H.: senior asst. county M.O., mental health services, Kent.  
 BIRD, C. A. K., M.R.C.S.: pathologist, Altrincham General Hospital.  
 BRADSHAW, D. B., M.A., M.B. Dubl., D.P.H.: deputy M.O.H. and deputy school M.O., Leeds.  
 BURN, R. A., M.B. Durh., D.O.M.S.: assistant to professorial unit in ophthalmology, Royal College of Surgeons and Royal Eye Hospital, London.  
 DEVENISH, E. A., M.B., M.S. Lond., F.R.C.S.: surgeon, orthopaedic and traumatic unit, West Middlesex County Hospital.  
 HECTOR-JONES, DAVID, M.R.C.S., D.M.R.D.: asst. radiologist, Hampstead General and North-West London Hospital.  
 HILL, I. M., M.B., M.S., Lond., F.R.C.S.: registrar, department of thoracic surgery, Guy's Hospital.  
 KENTON, COLMAN, M.R.C.S.: regional psychiatrist, North-West Metropolitan Region.  
 RAWLINGS, K. O., M.B. Lond., M.R.C.P.: consulting physician, County Hospital, Farnborough, Kent.  
 SAMSON, K. J., M.D. Hamburg, M.R.C.P., D.O.H.: paediatrician to outpatients, German Hospital, Dalston, E.3.
- Birmingham United Hospital:**  
 BOND, W. H., M.B. Birm., F.R.C.S.: asst. radiotherapist.  
 CRABTREE, N. L., M.R.C.S., D.L.O.: asst. surgeon, ear, nose, and throat department.  
 GOUREVITCH, ARNOLD, M.C., F.R.C.S.: asst. surgeon.  
 INNES, ALEXANDER, M.B.E., M.A., M.B. Camb., F.R.C.S.: director of casualty department and asst. surgeon to traumatic department.  
 WHITFIELD, A. G. W., M.B. Birm., M.R.C.P.: asst. physician.

**Diary of the Week**

MAY 9 TO 15

**Monday, 10th**

- ROYAL COLLEGE OF PHYSICIANS, Pall Mall East, S.W.1.  
 5 P.M. Dr. Macdonald Critchley: Disorders of Sleep.  
 MEDICAL SOCIETY OF LONDON, 11, Chandos Street, W.1.  
 8.30 P.M. Dr. A. H. Douthwaite: Lure of Drugs. (Annual oration.)  
 INSTITUTE OF LARYNGOLOGY AND OTOTOLOGY, 330, Gray's Inn Road, W.C.1  
 6 P.M. Mr. Geoffrey Bateman will show cinematograph films (made by Dr. Paul H. Hollinger) on Organic Disorders of the Larynx and Bronchial Neoplasms.

**Tuesday, 11th**

- ROYAL COLLEGE OF PHYSICIANS  
 5 P.M. Dr. J. G. Scadding: Pneumonias Associated with Virus Infections.  
 INSTITUTE OF DERMATOLOGY, 5, Lisle Street, W.C.2  
 5 P.M. Dr. R. M. B. MacKenna: Lichenoid Eruptions, including the Neurodermatoses.  
 INSTITUTE OF LARYNGOLOGY AND OTOTOLOGY  
 2.15 P.M. Dr. E. H. R. Harries: Respiratory Tract in Infectious Diseases.

**Wednesday, 12th**

- BRITISH ASSOCIATION OF PHYSICAL MEDICINE  
 5 P.M. (Royal College of Surgeons, Lincoln's Inn Fields, W.C.2.)  
 Dr. L. Cosin, Dr. Margery Warren: Physical Methods in Geriatrics.  
 ROYAL MEDICO-PSYCHOLOGICAL ASSOCIATION  
 11 A.M. (Royal College of Physicians, Kildare Street, Dublin.)  
 Dr. J. Kearney, Dr. T. W. H. Weir: Legislation and Mental Health.  
 2.15 P.M. Mr. John Hayward: Personality of Dean Swift.  
 ASSOCIATION OF SEA AND AIR PORT HEALTH AUTHORITIES OF THE BRITISH ISLES  
 10 A.M. (Guildhall, Swansea.) Opening of annual meeting.  
 UNIVERSITY OF GLASGOW  
 8 P.M. (Department of Ophthalmology.) Dr. James Hill: Disturbances of Lacrimal Apparatus.

**Thursday, 13th**

- ROYAL MEDICO-PSYCHOLOGICAL ASSOCIATION  
 10.15 A.M. (Grangegorman Hospital, Dublin.) Dr. J. Dunne: Ten Years' Survey of Physical Methods of Treatment.  
 2.15 P.M. Dr. H. J. Eustace: Addiction under the Mental Treatment Act, Eire, 1945.  
 CHADWICK LECTURE  
 4 P.M. (University College, Nottingham.) Sir Arthur MacNalty: Advances in Preventive Medicine during the War of 1939-45.  
 HONYMAN GILLESPIE LECTURE  
 4.30 P.M. (Edinburgh Royal Infirmary.) Mr. F. R. Brown: Abdominal Pain.

**Friday, 14th**

- ROYAL COLLEGE OF PHYSICIANS  
 5 P.M. Prof. R. V. Christie: Bright's Disease.

**Births, Marriages, and Deaths****BIRTHS**

- ASHWORTH.—On May 1, in London, the wife of Dr. H. K. Ashworth—a daughter.  
 BLOOM.—On April 22, in London, the wife of Dr. Harold Bloom—a son.  
 DALEY.—On April 25, the wife of Dr. Raymond Daley—a son.  
 DUTTON.—On April 22, at Burton-on-Trent, the wife of Dr. G. C. D. Dutton—a son.  
 HAND.—On April 26, in London, the wife of Dr. B. H. Hand—a son.  
 ILLINGWORTH.—On May 1, at Sheffield, to Cynthia Illingworth, M.R.C.P., wife of Prof. R. S. Illingworth, F.R.C.P.—a daughter.  
 MATHERS.—On April 29, at Wallasey, the wife of Dr. R. G. Mathers—a daughter.  
 NICOL.—On April 21, at Lagos, Nigeria, the wife of Dr. Bruce Nicol, O.B.E.—a daughter.  
 OAKLEY.—On April 26, at Wolverhampton, the wife of Dr. Douglas Oakley—a son.  
 STEPHEN.—On April 23, the wife of Dr. C. S. M. Stephen—a daughter.  
 TALBOT.—On April 27, at Romford, the wife of Dr. John Talbot—a daughter.

**MARRIAGES**

- ALLEN—GILLING.—On April 22, at Exeter, Howard William Allen, M.D., to Eileen Mary Gilling.

**DEATHS**

- CHRISTIE.—On April 25, at Stibbington, William Francis Christie, M.D. Edin.  
 CONRAN.—On April 27, Philip Crawford Conran, M.D. Lond., aged 63.  
 HILL.—On April 29, at Rochester, Staffs, Arthur Hilary Clifton Hill, M.R.C.S., aged 60.  
 ILOTT.—On April 28, at Bromley, Kent, Cyril Herbert Thomas Ilott, M.A., M.B. Camb., aged 68.  
 SIMSON.—On April 24, at Wanstead, James Tudhope Simson, M.B. Edin.  
 STOBIE.—On April 27, at Sutton, Surrey, Harry Stobie, F.R.C.S., F.D.S.  
 WILSON.—On April 29, in Edinburgh, John Clark Wilson, M.D. Edin., M.R.C.P., F.R.C.S.E., D.P.H., aged 77.  
 YOUNG.—On April 24, at Market Drayton, Salop, William Arthur Bruce Young, M.B. Manc., D.P.H.

# THE LANCET

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PHYSIOLOGY, PATHOLOGY, PHARMACOLOGY, PUBLIC HEALTH, AND NEWS

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## PSYCHIATRY AS APPLIED TO OCCUPATIONAL HEALTH\*

DONALD STEWART  
M.D. Edin., F.R.C.P.E.

OCCUPATIONAL health is that aspect of medical practice concerned, among other things, with achieving harmony between the capacities of any individual and the demands of his occupation. Inevitably it must take heed of qualities of mind and temperament as well as organic health; and from that point it spreads to embrace group reactions and attitudes and the consequences of these to the individual, to the worker group, and even to society at large.

At the end of the late war the problems of resettlement of those who had been temporarily uprooted from their homes underlined the importance for the individual of disruption in the continuity of his past. This emphasised what is true of industrial experience, that the adjustment of the worker to his job and its circumstances depends as largely on continuing ties and loyalties to people and things around him as on his own intrinsic qualities. Realisation of the importance of issues of this nature has created a demand for more information about relationships between groups of workers and between these and the management which controls them. In industry, therefore, we are brought face to face with the question of individual psychological differences in normal people in a way which compels attention through its practical consequences.

Elucidation of the many intricacies of collective attitudes, sources of discontent among workers, group anxiety, and mass unrest have hitherto come mainly within the sphere of the industrial psychologist. He has done work of much significance, both in the field and in the laboratory. But a greater opportunity to resolve some of these problems is offered through the less remote medical approach. Knowledge, however precise, of the prevailing causes of disharmony within worker groups is of little practical value unless it can be used as a foundation on which a prescription for better relationships in industry can be made. Without the intimacy of the clinical approach, based on an accurate knowledge of man's normal physical and mental make-up and of deviations from the normal, much of the work of the psychologist, no matter how brilliant and apparently effective, can well be sterile.

In the same way pure theorists whose fame rests only on their ability to champion one or other school of psychiatric philosophy are unlikely, especially if they work in isolation and at a distance from the factory floor, to contribute much to industrial problems. What industry increasingly requires is a doctor versed in both industrial and psychiatric matters and who talks the common language. Likewise, the study of occupational circumstances by students of social pathology becomes important if psychiatry is to play an effective part in contributing to the resolution of current industrial problems.

### SELECTION FOR OCCUPATION

Present methods of selection for occupation are largely haphazard. An appointment is nearly always filled on the basis of the candidate's previous record of success; or, if several candidates with similar qualifications present themselves, final selection results from interview. But in industry many executives have a highly developed power of intuitive judgment which entitles them to make decisions on the choice of personnel.

The state of the labour market has an obvious bearing on the selection of manual workers for jobs. When there

is unemployment industry has a large choice of workers, a fact which, before the war, retarded the general development of scientific and equitable methods of selecting personnel. Today there is an apparent lack of man-power in the country, and its distribution is criticised by those who differ on the degree to which trades are considered essential to a national economy. The time is therefore opportune to introduce planned schemes of selection. Results of this will be reduction in labour wastage and absenteeism, combined with greater efficiency of the individual and increased output.

Selection of administrative personnel, managers, and foremen presents peculiar difficulties. Their selection must be more thorough and take into account qualities less necessary in the factory hand; among these are intelligence, powers of judgment and decision, and qualities of leadership.

The need for improved methods of placing men in industry has been accentuated by the number of disabled and handicapped persons.

An attempt at solution has been made by the Ministry of Labour, which has produced a special form, D.P.I., for use in placing disabled people in industry.

This form is designed to assess the extent of the workman's physical incapacity but does not include sufficient information to allow of any psychological capacity being taken into account and related to a particular job suggested for him.

None the less it represents a valuable mechanism which lends itself to improvement, perhaps by simplification; so it is hoped that it may be so modified as to enable worker and job to be matched in all respects.

In America the methods of matching job and worker have been greatly amplified, but only in the direction of more and more physical minutiae. Physical capacities have obviously to be assessed by a doctor. So, since it is clearly desirable that an artificial division between psychological and physical capacity should not be made, there is need for doctors working in industry to develop psychological insight into the material with which they are dealing. The specialised training of an industrial psychologist in the precise estimation of factors such as intelligence, aptitudes, and personality traits, as well as educational levels and technical skill, suggests that working partnerships between medical officers and psychologists offer an interim answer to this problem.

### REHABILITATION AND RESETTLEMENT

Proper resettlement of persons disabled either surgically or medically into work is a major responsibility of any occupational-health service. It becomes a means of promoting good worker-management relationships and consequently good industrial morale, and it minimises the incidence of neurotic sequelæ during convalescence.

The Austin Motor Company has shown the value of a planned scheme for industrial rehabilitation.

Here a special rehabilitation workshop was set up some four years ago as part of the general scheme of health supervision at the factory.<sup>1</sup> During this time over 1000 disabled employees have passed through the shop.

Though the experiment was originally designed to deal with accidents, the need for widening its scope to include medical and general surgical cases was soon realised.

At present workers are admitted whose working capacity is so lowered, by age or by slowly developing debility, that they cannot continue their normal occupation. In a new environment capacity, physical and mental, is reassessed under gentle conditions but yet where a living wage is paid, and the man is eventually found a new job in the factory proper.

Once workers know that they have available an alternative to either full work or unemployment, they are relieved of much of the anxiety of economic insecurity.

There is one factor common to everybody in the shop; without it each person would be off work, at a cost to hospitals,

\* Read at the annual meeting of the Royal Medico-Psychological Association, July 10, 1947.

1. Stewart, D. *Proc. R. Soc. Med.* 1946, 39, 158.

to themselves, and to the State; with it they produce goods, earn money, expedite their recovery, and retain their self-dependence. Economic and social rehabilitation are therefore assured. The incentive to the disabled worker to enter the shop is to earn more money than he would receive in sickness or accident benefits. The fact that here he is paid at rates less than before the onset of his disability makes him soon appreciate a second incentive, to progress smoothly through different jobs in the shop until the day comes when he can return to his original work and his original pay.

This experiment has now become, in part at least, a study in social psychiatry and an interesting development in group psychotherapy within a work community. The scheme realises the psychological needs of any incapacitated or handicapped person. It takes him away, early in his treatment, from the hospital atmosphere where accent is inevitably on disability and disease. It removes financial anxiety and the fear of not being taken on again. It alters a man's attitude to his mates, to his manager, to the firm, and to his home—inevitably for the better, because he lacks reason for grievance. There is less tendency to retain the memory of disabilities. Neurotic manifestations and recurrences are minimal. The shop morale is good and often upgrades that of the individual.

When he re-enters the factory proper his new standard is maintained. The 1000 workers who have now belonged to the shop group exert a significant influence on the attitudes and morale of their 16,000 colleagues in the firm.

Apart from its value in these wider aspects of morale the scheme allows of a day-to-day contact between the medical staff and a section of semi-fit and disabled employees at work. Once the man is told in simple language of the immediate and ultimate effects of his disablement, and is reassured about his future employment, he is willing to cease worrying about it and transfers his load of anxiety on to the shoulders of the doctor. The warmth of the clinical approach appears to pay a dividend.

#### THE YOUNG WORKER

Supervision of the health of young factory workers at their place of work is at present largely limited to an initial statutory medical examination. Schemes for continuing health and welfare supervision are uncommon and technical supervision is largely casual, apart from apprenticeship schemes. But the effect of introducing such schemes, whether technical or personal, is of some importance. The almost universal success of apprenticeship schemes owes much to the fact that the youth knows where he is going, that something is being done for him, that he is part of a well-planned whole, and that his own efforts will help him to reach a goal which he can determine.

The unapprenticed youth offers a contrast. For him there is no framework into which he can fit; his background, home circumstances, and opportunities may be inferior and he is often offered work which is stereotyped and a dead end. Thus discontentment can develop at an early age, followed in later life by continuing disharmony and ineffectiveness. On the other hand, contented and efficient workers can be produced by the proper planning of training and supervision during the formative years.

When a juvenile is accepted for employment at the age of 15 he has already developed qualities which will remain relatively constant throughout his working life. He has a certain physique, his intelligence is of a certain level, he has benefited or otherwise by a school education, his interests and hobbies have become established, he has certain attitudes to other people, and his character has begun to be moulded. But sudden transition from the comparative protection of the school to the bustle of the factory means that a new type of training has begun; coming to work thus becomes the hard core both of education and experience.

Free choice of occupation is the right of everybody—an argument against too much scientific method—but for the young person informed advice can be of much assistance. Initial guidance considers health, social

education, family background, personal preferences, and natural aptitudes. To this end team-work is obviously necessary and includes collaboration between juvenile-employment officers of the Ministry of Labour, personnel officers, and, in smaller firms, managers.

Continuous supervision of occupational health can be carried out effectively only by an industrial medical officer, but he has to create links with the school medical officer and the general practitioner. Important contacts may have to be made with parents. The doctor, and those responsible for selection, should become interested in the child's school record. Here may be found indications of character, ability to mix with others, and sportsmanship; or, on the other hand, truancy and disloyalty. This may assist vocational advice, but formal tests of intelligence may have to be used. Developments in the application of these tests for adolescents within industry, and their significance, are now being studied as part of plans for placing people in industry. By themselves they are not of value unless they are related to the psychological demands of the job.

When physical and psychological characteristics of the juvenile have been assessed the next thing is to find the job into which he or she can be fitted. Knowledge of jobs is therefore essential and must be based on accurate job specifications. The various occupations suitable for juveniles should go into broad categories and be planned to lead to satisfactory adult employments. Classifications need not be rigid so long as certain broad lines are defined. Two to three years should be sufficient for a juvenile to pick up an all-round experience, and the final choice of job can be made at about the time of maturity.

Though initial guidance is valuable, and because impressions from single interviews are usually fallacious, it is even more important to observe progress under training and to identify, analyse, and record success or failure. Results can then be correlated with any prediction and advice given at the time of entry. Only thus can be determined the value of scientific selection, the quality of supervision at work, changes in outlook and attitude, and positive facts about physical development.

Once a juvenile has been placed in a particular job, both human and material influences may be brought to bear on him. He has to conform to factory routine and discipline, accept practical instruction from his seniors, and become accustomed to his new environment. Success or failure does not rest with him alone; much will depend on the attitudes of those in charge of him. It is therefore important to enlist the aid of employees interested in the problem and at the same time to watch those who are not. Once juvenile training becomes established, there is less need for patronage from adult workers. Juniors assist and work with selected craftsmen and thus gain experience. Progress through various jobs is a matter for management, but help is required from the doctor with knowledge of the associated human problems.

#### TRAINING IN INDUSTRY

In industry the doctor has so far taken little or no part in the training of individuals, apart from giving occasional instruction in accident prevention and personal hygiene. The field of technical training in industry has recently created widespread interest, and present trends show that there is a potential relationship between future developments there and the subjects of psychiatry and occupational health. Training of new entrants to industry, particularly of youths under apprenticeship schemes, is generally accepted in the engineering trades. At Government training centres men and women receive simple vocational training designed to fit them for future careers, largely in semi-skilled occupations. Training of foremen and supervisors has recently been actively pursued. To this end training-within-industry schemes

(T.W.I.), originating in the United States, have been specially developed in this country, sponsored by the Ministry of Labour; T.W.I. has three phases: methods of job instruction, instruction in human relations and leadership, and instruction in efficiency—i.e., in the development of simple, time-saving, and fatigue-reducing methods of production. Results appear to be satisfactory; some firms are enthusiastic, though others do not recognise the need for planned methods. But the important fact remains that, generally speaking, industry has accepted the need for training in this field.

There is a recent tendency for those who have never managed anything to insist on "a share in the management" of industry. But management is an occupation just as much in need of protection and respect as any other job, and for it education and experience are equally necessary. Evidence of the need for training at this level is shown in a recent report of a special committee set up by the Minister of Education.<sup>2</sup> Here it is estimated that over 400,000 persons are "engaged in managerial functions" at present, and that an annual intake of some 12,000 recruits is required.†

The suggested syllabus of training, which is comprehensive in the technical, business, and commercial fields, also includes such subjects as personnel selection, placing, training, health, welfare, and safety; measurement of work and incentives; psychology and management; general psychology, including the psychology of attention, memory, learning, imagination, suggestion, instincts, and emotions; general psychology and psychiatry; industrial psychology, including the psychology of individual differences, measurement of intelligence, attainments and special aptitudes, personality and character, testing of temperament, psychology of the interview, interview techniques, vocational guidance and selection, psychology of training, of work, of incentives, and of work study; social psychology, including the human factor in industrial relations, initiation of individuals to industrial groups, rehabilitation, group reactions and inter-reactions; the Hawthorne experiment, the abnormal worker, individual and group morale, and the psychological bases of morale.

The section on work management and incentives includes time and motion study and analysis, including the principles of motion economy, man and machine chart analysis, fatigue studies, working conditions, human problems of convincing management, labour, and operators; incentive systems, financial and non-financial; and job evaluation, which includes job analysis, job specification, and their practical application.

These subjects are to be taught "in technical and commercial colleges," and more often than not to part-time students already in jobs. Training will be followed by intermediate and final examinations. The report admits the difficulty in obtaining suitable teachers. "We have no doubt," it states, "that there exists a potential supply of men and women with appropriate experience, willing to devote a part of their time to this work," but no more concrete proposals are made. The Minister of Education has approved the report; so the Government obviously propose to develop the scheme. It will therefore be interesting to see how far doctors, especially those engaged in teaching psychiatry and occupational health, will be invited to take part in this extensive and ambitious educational programme.

Though the main purpose of this training is to increase the efficiency of industry, the need to inculcate into the industrial structure the principles of man-management is now obviously accepted in the highest quarters. The head of any organisation, large or small, has to keep individuals and groups of individuals working effectively together and in harmony. So training to this end, as well as experience over years, is obviously desirable. But

a sense of perspective is necessary, particularly in the present industrial situation. Because of a natural interest in human behaviour there is a danger that the layman, when first faced by work problems involving individual or group psychology, may develop an interest in and attribute relevance to them out of all proportion to their actual weight. The importance of the human factor is then in constant danger of well-meaning exaggeration. Unnecessary services for employees may be provided—unnecessary, that is, in a good organisation. To keep psychological problems in their right place as an important part of the greater whole of management and efficient production equivalent consideration must be given to other factors, important in the over-all scheme of any firm, such as premises and their suitability, machine tools and manufacturing equipment generally, production planning, purchasing, and the wide implications of finance. The good manager can assess the relative importance of each of these matters in his particular organisation and knows just when to alter emphasis on any one of them.

#### MORALE IN INDUSTRY

In discussing the need for promoting and establishing machinery for consultation between management and workers the question of morale in industry eventually arises. The chief reason for recent strong pronouncements on the subject of joint consultation is the hope that its influence on the attitude of the workers towards their work and their employer will lead to increased output—in other words, that morale will be raised. Analysis of this subject shows that it is now coming to be understood that efficiency and high productivity depend on industrial morale no less than on mechanical equipment.<sup>3</sup>

The causes of good or bad morale are not easily determined, but it is obvious that joint consultation is more a matter of contacts than of committees.

The root of the problem seems to lie in an attitude to work which is described as economic irresponsibility. This attitude may be derived from the economic and industrial structure of a community; it certainly is closely related to political and social factors outside industry.

Some of the symptoms of lowered morale are indifference to output and to the achievement and fate of the enterprise for which a man works; failure of the individual to understand the significance of his own work to the community; suspicion of the motives of the management; and the belief that the interests of labour and management are diametrically opposed to each other.

These points have to be frankly discussed before any formal consultative machinery in industry can be made to work. Habits of mutual trust and consultation before decisions are taken are as fundamental for democracy in industry as for democracy in political or social life.

The ultimate function of joint consultation is to get rid of the division of factories into "bosses and the rest" which still colours the background thinking of most people. It has been said that this wrong conception of management is traceable to the fact that some people when given responsibility do not like consulting people under them.

Additional evidence of low morale is when workers demand security and control of industry but refuse to share the risks of industrial enterprise. They pursue sectional claims on the product of industry regardless of their effect on the national economy. This is a menace to the national well-being and is incompatible with political responsibility and good citizenship.

Yet a change of attitude on the part of labour cannot be expected unless there is a modification of those features in the industrial structure which are incompatible with a democratic way of life.

The psychological effect on workpeople of having been consulted is more important as a rule than the actual contribution of ideas made by them. Many employers are still insufficiently aware that the working group is a miniature society, and that for its proper functioning the art of social management is as important as the technical management of machinery and processes.

3. *Times*, May 20, 1947.

2. Education for Management. Report of a special committee appointed by the Minister of Education. London: H.M. Stationery Office, 1947. Pp. 32, 6d.

† By "management" in this context the report understands "all those activities (in industry and commerce) involving responsibility for the work of others."

A management of traditional structure should realise that, to obtain coöperation from workers conscious of their democratic rights, discussions with representatives of worker groups are a necessary preliminary to this end. But allowances must be made, in considering the manager's own personal morale, for the day-to-day difficulties and frustrations with which he has to contend—shortage of materials, shortage of labour, innumerable delays, controls, and the cold comfort of Government departments.

The Hawthorne experiment,<sup>4 5</sup> so called because it was carried out at the Western Electric Company's Hawthorne Works in the United States, is perhaps the most significant contribution yet made to the problem of determining morale in industry. The immediate lesson appears to be that we have to recognise and respect those work relationships which develop within groups in most organisations, large and small. Groups develop an identity of their own which can enable them to take over some of the functions of supervision and set behaviour standards at least as high as most employers would demand. On the other hand, they can develop among employees attitudes towards work which are based on misunderstandings due to lack of correct information. From this awkward situations may arise where groups faithfully believe something to be true which is in fact untrue. The experiment showed that improvement in conditions of work, discussed and explained to workers, gave rise to increased output. But, more important, the increased range of output continued when a return was made to the original imperfect conditions. These results were fully confirmed. The group had obviously developed some inherent force and had unconsciously, but yet effectively, organised itself for the specific task before it.<sup>6</sup>

Factors influencing morale are, among others, development of security, discipline and disciplinary action, leadership, individual behaviour, conditions at work, facilities for joint consultation and the development of joint responsibility, and specific incentives. Probably the strongest motive for working is a man's desire to secure his own livelihood and that of his family. There is the lesser motive of a desire or urge to create. And there is the determination to achieve distinction among his fellows. These motives are strengthened and reinforced by schemes and devices, at the place of employment, to which the term incentive is applied. The incentive has the power of awakening, maintaining, and strengthening the motive.<sup>7</sup> Satisfying incentive systems will improve morale, and in these the basic incentive is that of finance. But there are other incentives, and some of these have been outlined by presupposing the existence of certain qualities<sup>6</sup>: pride in rendering a service useful to the community; satisfaction in doing a job well; contentment through working in security with a competent and trusted chief; stimulation conditioned by opportunity for promotion; fulfilment arising from the performance of creative or constructive work; responsibility developing from opportunity to take the initiative; and a sense of participation arising from being consulted in matters of management.

The application of these incentives in industry would do much to improve relationships and encourage mutual trust between management and employees. Opportunities of personal satisfaction for the individual would be regained, and harmony promoted more readily than through the defensive partisan approach of worker groups. The effect of this on our economic and social life would, to say the least of it, be interesting.

4. Whitehead, T. N. *The Industrial Worker*. Harvard, 1938.
5. Roethlisberger, F. J., Dickson, W. J. *Management and the Worker*. Harvard, 1947.
6. Milward, G. E. *An Approach to Management*. London, 1946.
7. Hall, P., Locke, H. W. *Incentives and Contentment*. London, 1938.

## IS RHEUMATISM A VIRUS DISEASE?\*

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(Concluded from p. 701)

### SUGGESTIVE LESIONS PRODUCED EXPERIMENTALLY BY VIRUSES

The activities of the agent operating in acute rheumatism are manifested in two chief directions—a highly selective and enduring inflammatory action on fibrous tissue, and a special tendency to attack the heart.

In an experimental study of the pathogenic "repertoire" of individual viruses carried out with the generous help of the Medical Research Council at St. Bartholomew's Hospital during the inter-war years, two instances came to light in which a virus, when its virulence had been raised by passage to its highest pitch—and apparently only then—was found to produce one or other of these two chief effects of the agent that causes rheumatism in man.

#### (1) *A Virus that Produces Fibrositis*

The first of these was the M4 virus of Tulloch isolated by Sobernheim from pooled smallpox crusts collected from the beds during an outbreak at Dundee. This variola derivative proved to be particularly pathogenic. To raise its potency to the full, it was passed through the testes of a series of rabbits and then injected intravenously in repeated doses to see if it would produce endocarditis in the way that certain streptococci of the viridans and faecalis groups may do in similar circumstances. No endocarditis was observed; but, instead, signs of rheumatism developed in the rabbits, consisting of stiffness of a joint accompanied by periarticular swelling. The region most often affected was near the tendo Achillis, where an oedematous swelling of the tendon sheaths, aponeuroses, and sheaths of the muscles could be felt. On further examination the oedema was found to consist of a serofibrinous exudate containing lymphocytes, with the virus in great abundance and in pure culture. But the most striking (and unexpected) feature revealed by histological investigation was the highly selective inflammatory action of this M4 virus on the fibrous tissue of the tendons, muscle sheaths, aponeuroses, &c., including the fibrous covering of nerves, and in at least one instance penetrating through the perineurium and causing oedema and swelling of the connective tissue inside the nerve trunk and round the nerve bundles (fig. 4).

Further details of these observations were given by Gordon (1939), and a low-power view of a cross-section of a nerve trunk was published (Gordon 1946). In the former communication additional observations were included in which the effect was tried of mixing M4 virus with the hæmolytic streptococcus. Each appeared to increase the pathogenicity of the other; and, when a mixture of the two was injected intravenously, the virus suppressed the streptococcus altogether in the rabbit's tissues. Another point of interest was that the M4 virus at one stage lost its fibrositic capacity, which was only regained after fresh testicular passage. Perhaps the dense fibrous tissue of the mediastinum and tunica of the testis brings out this latent fibrositic capacity of M4 virus to the full. Dr. Ralph Stockman, who saw sections of these lesions produced by M4 virus in the rabbit, agreed that they were similar to those present in rheumatism, but thought that other causes too might give rise to them.

#### (2) *A Virus that Attacks the Heart*

The second specimen was a strain of psittacosis virus that, when its virulence had risen to the highest point

\* Based on a lecture given to the rheumatism unit at St. Stephen's Hospital (L.C.C.) on June 2, 1947.



by passage through mice, exhibited a special capacity for injuring the myocardium of the rabbit.

The strain had been isolated in February, 1930, from the spleen of a parrot suspected of conveying the disease to its owner, case 9, of Horder and Gow (1930). A study of specimens of virus from these cases was published by Gordon (1930), attention being drawn to the interesting fact that strains derived from the parrot proved to be more pathogenic to the mouse than those from man. The present parrot—a green one—predeceased its owner by a few days, and a suspension of its spleen in distilled water was injected into two mice, which died in 6 days, and from their spleens it was passed on to further mice, which died regularly in 2–3 days. After the fifteenth successive mouse a further pair were inoculated, one intraperitoneally and subcutem, the other intracerebrally: both mice died in 2–3 days, and the suspensions of the spleens and brains of both were titrated on the shaved skin of rabbit no. 625 by injecting 0.1 ml. of falling amounts of each intracutaneously. The spleen of the first mouse and the brain of the second produced a positive response (papule) on the rabbit's skin up to a dilution of 1 in 10,000. Seven days after the cutaneous inoculation, rabbit no. 625 died suddenly, and post mortem there were generalised gelatinous oedema all over the body beneath the skin, and clear serous effusions into both pleural sacs and into the peritoneal cavity. From the latter, after the overflow had escaped, 15 ml. was removed by pipette. Films and cultures were negative, but the virus was recovered from the spleen, suprarenal glands, and nasal mucosa. Sections of the organs showed little change save in the heart, where evidence was found of acute interstitial myocarditis (figs. 5 and 6).

The virulence of this parrot strain of psittacosis virus appeared to fall off at this point, since further rabbits inoculated in similar manner with it, though they became ill, did not die; but when one of them, no. 640, was killed on the fourth day after inoculation, a section of its left ventricle showed microscopical evidence of myocarditis (fig. 7).

Another point of special interest was the general hydræmia developed by rabbit no. 625, which was a near approach to that seen so often in human beings who have died of heart disease consequent on rheumatism. During a long experience I have never met with another instance of this kind in a rabbit. To the naked eye the heart of rabbit no. 625 did not appear to be hypertrophied. The kidney on section proved normal.

#### RESULTS OF DIRECT EXAMINATION OF CASES OF RHEUMATISM FOR EVIDENCE OF VIRUS INFECTION

It appears from the preceding observations that the commonest form in which viruses are visible under the microscope is as E.B.'s. Individual viruses act as highly specific antigens, giving rise in the blood to specific agglutinin, complement-fixing antibody, and other antibodies in the same manner as bacteria. Therefore, the following investigations by others, previously reported, in which search was made for evidence of a virus infection in rheumatism, obtain additional meaning and importance.

#### Agglutination of Elementary Bodies

Schlesinger et al. (1935) collected E.B.'s by centrifuging the pericardial fluid of patients with acute rheumatism and prepared hanging-drop suspensions of them. They observed that these bodies were agglutinated by serum from acute cases of rheumatism but not by control sera. Eagles et al. (1937) repeated these observations and considerably extended the field to include chorea, rheumatoid arthritis, and fluid from joints as sources of E.B.'s, as well as control suspensions of these bodies from non-rheumatic cases and a suspension of the E.B.'s of vaccinia.

The result of these and further investigations is described by Eagles (1939). Broadly, the previous work was confirmed; of 263 specimens of serum from cases of active rheumatic fever 123 gave positive results,

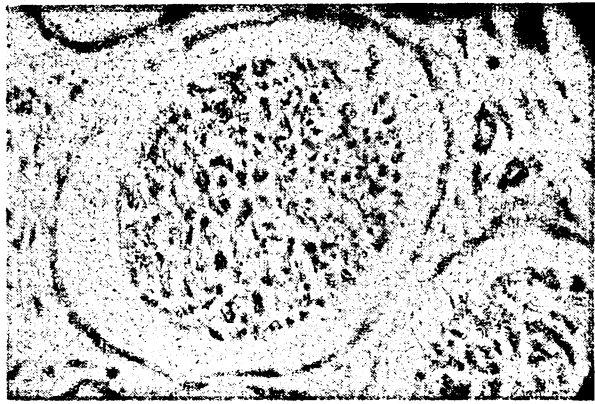


Fig. 4—Inflammatory swelling of fibrous tissue produced by M4 virus.

21 specimens from control cases being negative. Serum of 5 out of 8 cases of chorea gave positive agglutination of these rheumatic bodies, as also did that of 7 out of 21 cases of rheumatoid arthritis. When comparison was made of the response given by E.B.'s from the various sources to the same samples of serum, it was found that the distribution of positives and negatives was similar, whether the E.B.'s came from cases of rheumatoid arthritis, a fatal case of chorea, or cases of rheumatic fever. Suspensions from non-rheumatic sources were not agglutinated by the sera.

Evidence, therefore, was obtained consistently pointing to an interrelationship between rheumatic fever, rheumatoid arthritis, and chorea. In rheumatic fever a suggestively higher proportion of positive reactions occurred during a first attack as compared with recurrences; but positive agglutination was not confined to sera from active cases. It was found difficult to assess the relationship of carditis to agglutination, since it was an almost constant manifestation of the acute type. The presence of Aschoff nodules also did not run parallel to agglutination, though it was thought that the proportion of positive reactions was higher when they were present. In the control group of sera it was shown that neither pyrexia nor increased sedimentation-rate, nor positive Wassermann reaction was responsible for the agglutination of the E.B. suspensions.

In some later observations in collaboration with Dr. W. H. Bradley an attempt was made by Eagles to determine the precise relationship between the agglutination of the E.B.'s from rheumatic exudate and the stages of rheumatic infection. Agglutination occurred in quite a striking manner in acute rheumatic fever and acute rheumatoid arthritis, but many of these cases gave negative results. Agglutination was also obtained from sera of arthropathies unrelated to true rheumatic disease; so it cannot be maintained that the reaction is confined to rheumatic fever, rheumatoid arthritis, and chorea. It was, however, sufficiently striking in these diseases to uphold the earlier observations that the phenomenon is very real.

These careful observations on the agglutination of E.B.'s from rheumatism in the hanging drop are clearly of the greatest interest and strongly suggest that they are the actual bodies of the rheumatic virus agglutinated by a specific agglutinin to them in the serum of the patients—whether their illness takes the form of rheumatic fever, chorea, or rheumatoid arthritis. But it is a first step in a new direction; and the cautious attitude of Eagles is fully warranted.

Experience with the E.B.'s of vaccinia seems to indicate that the macroscopical method of observing agglutination is far superior to the hanging drop, and may with

advantage supersede it as it has with bacteria; flocculation tests read after 20 hours at 52°C are recommended.

As regards the fact that agglutination does not run parallel with the manifestation of Heberden's nodes, perhaps it is temporarily reduced from absorption by the multiplying virus, or other influences. In the case of antivaccinia serum the protective power does not always correspond to its titre in agglutinin and complement-fixing antibody, and may be at its best in the rabbit when through prolonged immunisation these have become greatly diminished. Again, there may be a group of rheumatic viruses.

Following on the observations of Schlesinger et al. (1935) films from the pericardial fluid and from lymph on the visceral pericardium in acute rheumatism were stained with Giemsa and examined by Coles (1935). The presence of E.B.'s was confirmed; they were round or oval, mostly isolated, a few in pairs, rarely in chains, and measured 0.17-0.26  $\mu$  in diameter—somewhat smaller than the vaccinia E.B.'s (figs. 2 and 3). Photographs of these rheumatism E.B.'s were included in his paper. He succeeded in finding similar bodies in the joint fluid in acute rheumatoid arthritis, but bodies morphologically resembling them were present also in the pericardial fluid of exactly half of fifty specimens of pericardial fluid from control cases; hence the value of employing agglutination to check the microscope is clear.

#### The Complement-fixation Test

If vaccinia is a safe guide, complement-fixation is more delicate than agglutination for detecting specific antibodies to a virus. Thus, when the titres of three specimens of antivaccinia serum to the homologous virus were determined by both methods, the end-points were by agglutination 1 in 140, 1 in 80, and 1 in 160; but by complement-fixation these same sera were active up to 1 in 200, 1 in 180, and 1 in 200 (Gordon 1925). Craigie has also drawn attention to this point. It is therefore probable, a priori, that, if rheumatism is a virus disease, complement-fixation will provide even more substantial evidence in favour of it than does agglutination, and the following observations deserve the closest attention.

Brokman et al. (1937) employed as antigen the liver of a child who had died of rheumatism.

The liver was found superior as antigen to the heart, even when Aschoff nodes were present, and to the spleen. The liver was minced, and 200 g. of it was put into a flask containing 800 ml. of saline to which 0.5% of phenol had been added as preservative. This 1 in 5 suspension was shaken for 4 hours in an apparatus and left for 6 weeks in a refrigerator at

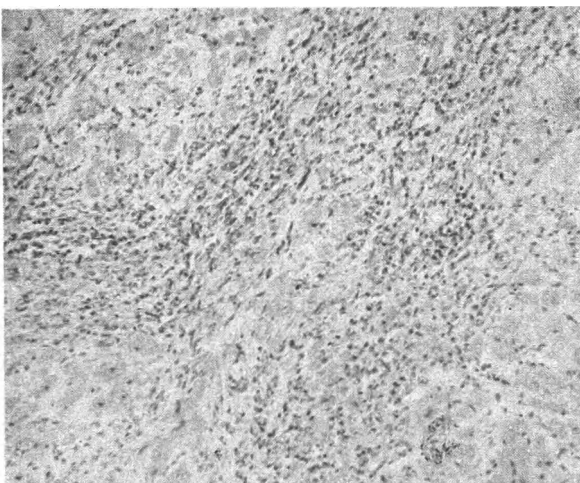


Fig. 5—Psittacosis-virus myocarditis in rabbit no. 625 (low power).

4°C. The supernatant fluid was then decanted and filtered through paper, and the clear filtrate was used as antigen in various dilutions. Antigens made in the same way from diseases other than rheumatism, including tuberculous liver, and Wassermann antigen, gave negative results.

The clinical results were as follows: the serum of 51 normal children gave 49 negative results, whereas the serum of 69 rheumatic children gave 61 positive results; and the serum of 69 rheumatic adults gave 54 positive results.

In June, 1939, the secretary of the Empire Rheumatism Council, Sir Frank Fox, through the British Embassy at Warsaw, where Brokman and his colleagues were working, inquired about this promising test from the director of the Children's Clinic, Warsaw, Prof. M. Michalowicz, and was informed that it had been used in 1000 cases of rheumatism and in numerous controls, and that "the results continued to be highly specific." Dr. Brokman was anxious to cooperate by sending some of his antigen over here for trial, but unfortunately was prevented by the German attack on Poland, and all attempts to get into touch with him since have failed. He managed, however, to send reprints of his published papers.

So far these observations by Brokman et al. do not seem to have been confirmed; so the mode of preparation of their successful antigen needs careful consideration.

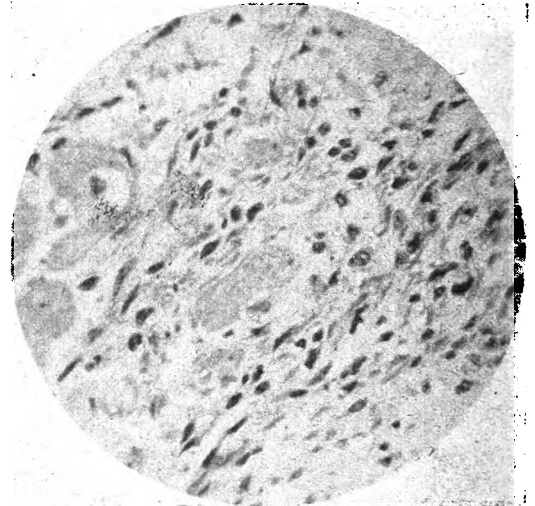


Fig. 6—Psittacosis-virus myocarditis in rabbit no. 625 (high power).

(1) The chief requirement is as strong as possible a suspension of the rheumatic E.B.'s. The liver used by Brokman may have been exceptionally rich in E.B.'s; but it should be noted that any E.B.'s present were given the best possible chance. Above all, Brokman avoided filtration, which greatly reduces the abundance of E.B.'s; for instance, in vaccinia almost all are removed by it, and in psittacosis, herpes, myxomatosis of the rabbit, and other virus diseases I have tested, the reduction is most severe.

(2) Then Brokman made an unusually strong concentration of the liver—1 in 5 instead of the usual 1 in 10 or 1 in 20 for pulp or organ suspensions—and very thoroughly broke it up, first by mincing, and shaking in a machine, followed by autolysis at 4°C for 6 weeks, thus getting as many of the E.B.'s as possible (or their remains in the cells) into suspension or solution. In experiments made some years ago in which the distribution of indian ink in the organs of rabbits after intravenous injection was investigated, it was found that the final resting place of the ink particles was chiefly in the liver.

(3) The addition of 0.5% of phenol has been used by me for many years past in preference to filtration, because it inactivates the bacteria without removing the E.B.'s, routine procedure being as follows: one-tenth of its bulk of 5% phenol dissolved in distilled water is added to the suspension, which is well shaken and then placed for 20 hours at 37°C, in which time cocci, *Bact. coli*, and even the tubercle bacillus are killed, whereas vaccinia virus is still alive, and so may



Fig. 7.—Psittacosis-virus myocarditis in rabbit no. 640 (high power).

be herpes or psittacosis viruses, though much reduced in abundance. Perhaps a shorter time at 37°C would suffice; but in Hodgkin's disease it is always necessary to bear in mind the possibility of tuberculosis as a secondary infection. After the incubation, the suspension was usually diluted to reduce the concentration of the phenol. Now if instead of 37°C the phenolated suspension is placed at 4°C in the refrigerator, the bactericidal action of the phenol is much slowed down, and the bacteria may be still alive after 10 days or more, though they are dead in a month. So, in using phenol in the way he did, Brokman was on sound lines.

In vaccinia, pure ether was preferred by me because it was less anticomplementary, and equally effective for killing common bacteria. It is only necessary to add 10% of ether to the suspension and leave it at room temperature for a few hours to kill cocci or *Bact. coli*, after which the ether can be evaporated at 37°C. Suspensions of pulp, collected from rabbit's skin 7 days after inoculation with vaccine virus, remained sterile and preserved the infectivity and antigenic potency of the virus unimpaired for months when etherised and kept in glass-stoppered bottles in the refrigerator. Such a suspension had a titre, on the rabbit's skin, of infectivity up to a dilution of 1 in 50,000, and its end-point as complement-fixing antigen was between 1 in 2000 and 1 in 3000. For easily read macroscopic agglutination in 20 hours at 55°C, the suspension, after being centrifuged for 5 min. at 3000 r.p.m. to deposit the lumps, had an end-point of 1 in 40.

(4) Suspensions of rabbit pulp containing vaccinia virus became more turbid and provided a more delicate index when kept for some weeks in the refrigerator at 4°C (Gordon 1925); so Brokman's procedure in repeating this with the suspension of rheumatic liver would improve its value as complement-fixing antigen.

#### SUGGESTIONS

To those investigating rheumatic disease for evidence of a virus infection the following suggestions may be useful:

(1) As viruses may become more delicate when their virulence is at its highest point, it would be worth while to test the value of glycerin (50%) for preserving rheumatic tissue or exudate when any evidence of recent inflammation is present.

(2) As the dried and powdered glands made the most promising antigen both for allergic tests and for complement-fixing antigen in Hodgkin's disease, this should also be tried with rheumatic tissue—the improvement made by Tulloch of freezing the tissue before drying it in vacuo being also used if possible.

(3) Perhaps most important, before examining cases of rheumatism for serological evidence of a virus, complete mastery of the technique necessary for success should be ensured by studying first in the same way some known

virus infection, such as vaccinia. Without this experience and training negative results have very little meaning; and irregular positives should not be taken too seriously, for they disappear with greater skill.

Judging from experience while investigating the action of vaccinia virus on the rabbit, it takes from six months to two years for a bacteriologist, whose previous serological studies have been limited to dissolved antigen or bacteria, to master the finer manipulations required for serological proficiency as a virologist. Hence the slow growth of this new knowledge, and frequent unawareness of its existence. For comparison with vaccinia, Shope-fibroma virus provides a good control; but in the case of Sanarelli's virus of myxomatosis of the rabbit the E.B.'s are more toxic and, though antibodies are demonstrable, mortality is high. Complement-fixing antibodies are easiest to obtain: agglutinins need more perseverance; and further antibodies remain for investigation, including the "neutralising antibody," which seems to be a form of lysin, and—perhaps the most elusive of all—an antibody that neutralises the endotoxin of the E.B.'s and may occur in rabbit's serum after prolonged and repeated immunisation against vaccinia. Possibly, in time, improved methods of extracting, purifying, and concentrating virus from the tissues will resolve present difficulties and permit the routine preparation of a more satisfactory antigen from the tissues of man direct. The fact that some of the specific antigen of vaccinia virus can be obtained in solution by boiling is encouraging.

Allergy also, in view of Wilson Smith's work, is a promising field still to be explored in man. But perhaps the most hopeful line at present lies in attempts to cultivate viruses in a susceptible animal, or in symbiosis with living cells, animal or vegetable (including fungi) in vitro. Meanwhile, it should be realised that in virus diseases of animals the problem is primarily bacteriological, and that chemistry, though capable of rendering invaluable assistance, cannot supersede bacteriology any more than it could, for instance, in the detection of sewage-born infection in drinking-water, or in the discovery of the tubercle bacillus, or of penicillin. In virus diseases of man and animals there is good reason to believe that, however small the infective organism, bacteriology can be adapted to deal with it. But the name might well be changed, and the science now coming into existence, to define the characters of the group of causal organisms concerned with smallpox, influenza, herpes, and apparently rheumatic fever, is described more accurately as virology.

Koch (1880) thought it very probable that micrococci, like other bacteria, formed spores resistant to staining. Seven years later, when John Buist by long-continued staining demonstrated, accurately measured, and portrayed the E.B.'s of vaccinia and variola, he believed that he had found these coccal spores, and rashly identified the E.B.'s as such. But he also realised that these bodies represented the causal organism:

"I have tried to show that the vaccine and variolous contagia are not dissolved in the lymph, but are suspended in it, in the form of very minute particles, which I look upon, from their size, as spores of micrococci. Standard vaccine lymph is alkaline, and contains spores in suspension, and these must be regarded, when judged by the effects of their pure cultivation in the animal body, as the true vaccinia contagium. Good vaccinators vaccinate with spores" (Buist 1887).

What Buist actually discovered was a new order of minute infective agents, the filtrable viruses, restricted to life within the living cells, and for that reason including among them some of the most active and potentially malignant of all man's enemies. It has justly been suggested by Prof. T. J. Mackie and Prof. C. E. van Rooyen that, in view of this service, the virus group should be given the name of Buistia.

## CONCLUSION

The chief infective agent in rheumatic fever, the rheumatic granuloma of Aschoff, is almost certainly a virus. Improved technique should lead to its establishment as such, provided that a determined effort is made to intensify research in this direction.

Special thanks are due to my friend and colleague Mr. J. E. Barnard, F.R.S., for the photographs of unstained E.B.'s reproduced in figs. 2 and 3. The definition of the vaccinia organism is the most brilliant that I have yet seen. The bodies in the pericardial fluid of rheumatism, however, in the photograph reproduced in fig. 3 (which has already been published by Schlesinger et al. in their important paper of 1935) are more hazy. This I suspect to be due to the piling of antibodies on them during the first stage of flocculation, such as can be seen when E.B.'s are brought in contact with homologous antiserum in vitro.

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## RUBELLA IN PREGNANCY AS AN ÆTIOLOGICAL FACTOR IN STILLBIRTH

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THE rôle played by rubella in the production of congenital malformations is now well known (Gregg 1941, Swan et al. 1943, 1944, 1946, Swan and Tostevin 1946, Swan 1944a and b, 1947). In a discussion on the subject Gibson (1945) mentioned that rubella appeared also to be associated with a high incidence of stillbirths. This observation did not occasion surprise, because Murphy (1940) had found that about a quarter of abnormal foetuses are stillborn.

In 1946 I made a survey of the ætiology of about a third of the stillbirths recorded in South Australia in the seven years 1939-45, with special attention to the incidence of infectious diseases during pregnancy. In view of the references of Aycock and Ingalls (1946), Goar and Potts (1946), Fox and Bortin (1946), Ober et al. (1947), and Wesselhoef (1947) to the occurrence of small numbers of abortions, miscarriages, and stillbirths as the result of infection of pregnant women with rubella, a summary report on this survey may be of interest.

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A stillbirth being defined as "a baby of 28 weeks or more maturity since conception, who is delivered without showing any signs of life" (Woolf 1946), 7 of the cases described by the American writers fall into this category. In the case reported by Aycock and Ingalls (1946) the time of the death of the foetus and the time of infection of the mother with rubella were uncertain. In the case reported by Fox and Bortin (1946) the mother contracted rubella when one month pregnant, and her child was hydrocephalic and stillborn. Goar and Potts (1946) described a case in which a mother had rubella during the first month of pregnancy and gave birth to twins, of whom one had congenital cataract and heart disease and the other was stillborn. Ober et al. (1947) reported 4 stillbirths following maternal rubella in pregnancy, in 2 instances during the second month of gestation, in 1 during the seventh month, and in 1 during the eighth month.

In the present investigation records of the stillbirths were made available, with the consent of the Minister of Health of South Australia, through the courtesy of the Principal Registrar of Births, on the understanding that no direct approach would be made to the mothers, and that permission to send the questionnaire † would be obtained from their respective medical attendants, who would act as intermediaries. This devious method of gathering information to some extent hampered the investigation, but every effort was made to avoid selection of cases, and it is felt that the results recorded are representative of the group as a whole, with the possible exception of unmarried mothers, about whom it was understandably difficult to obtain data.

## RESULTS

Of 2156 stillbirths registered in 1939-45 permission was given to send questionnaires to 1265 of the mothers, and 760 replies were received. One of the mothers had had stillborn triplets, and 2 had had stillborn twins, so the number of stillbirths resulting from the 760 pregnancies was 764.

Much of the information is analysed in the accompanying table, which deals with 16 cases of rubella in pregnancy, one of which (case 16) was doubtful. Two of the mothers who had rubella in pregnancy also had mumps, and another had varicella during the same pregnancy.

*Other Stillbirths.*—One mother (case 4) has had a stillbirth subsequently; the remaining 15 have had no other stillbirths either before or since the stillbirth recorded here.

*Miscarriages.*—Eleven mothers have had no miscarriages, 2 (cases 3 and 9) had one before the stillbirth, and 3 (cases 4, 6, and 14) have had one since the stillbirth.

*Children Since the Stillbirth.*—Since the stillbirth 3 mothers (cases 1, 3, and 12) have had no children, 6 (cases 4, 7, 8, 11, 15, and 16) one child, 5 (cases 2, 5, 9, 10, and 13) two children, 1 (case 6) three children, and 1 (case 14) four children, all of whom were healthy.

*Family History.*—In no instance was there a history of hereditary deformity or abnormality.

## DISCUSSION

Any conclusions to be drawn from the above data must be purely tentative, for the series is too small to be statistically significant, and in only 9 of the 16 cases was the diagnosis of rubella made by a doctor. Further, in 3 instances (cases 10, 13, and 14) there was a double infection during pregnancy, making it difficult to assess the respective rôles of the diseases in the ætiology of the stillbirth.

On the other hand, when the cases are arranged in order of the stage of pregnancy at which the mother contracted rubella, the striking fact emerges that in 13 of the 16 cases the infection occurred in the first four

† Details of the questions included will be supplied on application to THE LANCET office.

months of pregnancy—i.e., during the so-called "critical period" for the production of congenital abnormalities by rubella (Swan 1944b, New South Wales Committee 1945). Moreover, in 7 of the first 8 cases no cause for the stillbirth could be assigned by the medical attendant, though it is fair to point out that in case 3 the mother said that during pregnancy she had suffered from "blackouts" and hydramnios, and in case 7 the mother had had excessive vomiting. In case 16 (placed at the foot of the table because the diagnosis of rubella was doubtful) cause has been confused with effect—the cause is given as "macerated foetus" instead of "unknown." Altogether, then, in half the series of 16 cases there was no known cause for the stillbirth. In case 2 the stillbirth was attributed to malnutrition due to excessive vomiting, but it seems more likely that the brunt of this process would fall on the mother rather than on the foetus. Many of the infants with congenital defects due to rubella were below normal birth-weight (Swan et al. 1943). As regards the remaining cases, in most instances there were aetiological factors cited by either the medical attendant or the mother to which the stillbirth could reasonably be

ascribed. There was a discrepancy in case 15, however, for the diagnosis of prematurity was not confirmed by the duration of gestation; possibly the infant was premature in the sense that its birth-weight was less than 5½ lb. In case 10 (a twin pregnancy), since the surviving child was normal, it seems unlikely that either mumps or rubella played any part in the production of the stillbirth.

In the 760 pregnancies studied, infectious diseases other than rubella occurred as follows: morbilli (1 case), mumps (2 cases), mumps and whooping-cough (1 case), varicella (1 case), whooping-cough (1 case), influenza (21 cases), influenza or coryza (3 cases), influenza or pneumonia (1 case), lobar pneumonia (1 case), coryza (7 cases), bronchitis (3 cases), tonsillitis (1 case), and "gastric influenza" (1 case). The only infection, therefore, in which the incidence was comparable with rubella was influenza, and this is a relatively common disease. Bearing in mind the limitations of the data, none of the infectious diseases mentioned appeared to show any predominance in the early months of pregnancy such as is manifest with rubella.

ANALYSIS OF DATA ON STILLBIRTHS ASSOCIATED WITH RUBELLA AND OTHER INFECTIOUS DISEASES DURING PREGNANCY

Case no.	Infectious disease during pregnancy	Month of gestation at time of infection	Diagnosed by doctor	Date of last period	Date of birth	Sex of child	Birth-weight	Position of child in family	Unusual symptoms during pregnancy	Cause of stillbirth suggested—	
										By mother	By doctor
1	Rubella	Beginning of pregnancy	No	Oct. 10, 1940	June 11, 1941	M	lb. oz. —	2nd	Nil	Nil	Unknown
2	Rubella	Not > 1	Yes	—	Sept. 22, 1940	F	4 3	1st	Excessive vomiting	German measles	Malnutrition due to excessive vomiting
3	Rubella	1½	No	April 15, 1945	Dec. 22, 1945	M	6 4	3rd	Blackouts, hydramnios	Nil	Unknown
4	Rubella	1 to 2	No	Jan. 28, 1940	Nov. 15, 1940	M	—	1st	Nil	Possibly due to German measles; no other cause known	Unknown
5	Rubella	2	Yes	Sept., 1942	April 24, 1943	F	—	1st	Nil	Possibly German measles	Unknown
6	Rubella	2	Yes	—	Feb. 13, 1940	M	—	1st	Nil	German measles	Unknown
7	Rubella	2½	Yes	June 12, 1940	Mar. 24, 1941	F	9 0	1st	Vomited every day	Nil	Unknown
8	Rubella	2½	Yes	Mar. 6, 1943	Dec. 21, 1943	F	7 0	1st	Nil	German measles	Unknown
9	Rubella	2 to 3	No	Nov. 23, 1939	Aug. 16, 1940	F	2 8	2nd	Nil	Fall at 5 months	Prolapse of cord
10	Mumps Rubella	¾ 3	Yes Yes	May 10, 1940	Jan. 20, 1941	M	5 8	2nd (1 of twins)	Nil	Vomiting	Twin pregnancy. Other (male) child alive and healthy; 15 days early; cause of death unknown; body macerated
11	Rubella	4	No	Mar. 9, 1942	Nov. 1, 1942	M	3 4	1st	"Kidney trouble"	7 months baby because of kidney trouble	Toxæmia, prematurity
12	Rubella	4	Yes	May, 1940	Jan. 26, 1941	F	2 8	1st	"Hæmorrhage at 7 weeks"	Underdevelopment of mother; menstruated first at 17 years	Prematurity
13	Rubella and slight mumps	5	Yes	April 5, 1939	Dec. 26, 1939	M	6 12	1st	Nil	Nil	Premature separation of placenta
14	Rubella Varicella	5 5	Yes Yes	Sept. 14, 1939	May 4, 1940	M	—	2nd	Nil	Shock (mental)	Strangulation of cord due perhaps to fall 1 week before birth
15	Rubella	6	No	June 24, 1940	April 3, 1941	F	—	1st	Nil	Pyelitis at 8th month	Prematurity
16	Rubella	Not > 3	No	July, 1942	April 29, 1943	M	—	1st	Nil		Macerated foetus

\* Mother nursed rubella patients in a military hospital during the first three months of pregnancy, and thinks she may have had the disease without knowing it.

When a woman contracts an infectious disease during pregnancy, from the viewpoint of the embryo a number of possibilities may be envisaged:

- (1) The embryo or fœtus may be unaffected.
- (2) As a result of the direct action of the noxa or the indirect effect of the associated pyrexia, the embryo or fœtus may die, and an abortion, miscarriage, or stillbirth may result according to the stage of gestation.
- (3) Occurring early in pregnancy the infection may lead to congenital abnormalities, such as heart disease, as well as exerting a general deleterious effect on the embryo. The damaged embryo may then (a) be unable to survive to full term and, as mentioned above, an abortion, miscarriage, or stillbirth will ensue; (b) live to full term but be unable to survive the hazards of the birth process, so that a stillborn infant is born; or (c) live to full term and be born alive, resulting in a congenitally defective infant.

So far as stillbirths subsequent to maternal rubella are concerned, the evidence presented here and the case of Goar and Potts (1946) suggest that mechanism 3 (b) is the most important—the embryo being so affected by the rubella virus early in pregnancy that it dies at birth. This view will be confirmed if necropsies on stillbirths associated with proved maternal rubella reveal congenital malformations identical with those known to be caused by this disease.

Two of the cases reported by Ober et al. (1947) suggest that rubella contracted late in pregnancy also leads to stillbirth.

The present paper is published in the hope of stimulating further work. What is required is an extensive long-term investigation in which the effects of various infectious diseases in the mother are studied as aetiological factors in abortion, miscarriage, stillbirth, and congenital defects. In this connexion the compulsory notification of all infectious diseases contracted during pregnancy is strongly advocated.

#### SUMMARY

In 760 stillbirths recorded in South Australia in 1939–45 there were 16 instances (1 doubtful) of maternal rubella during pregnancy, and in 13 of these cases the infection took place during the first four months of pregnancy. Though various other infections had been contracted by these mothers in pregnancy, rubella was the only one which showed this particularly high incidence in the early months.

It is suggested that rubella may be a factor in the causation of stillbirths by damaging the embryo early in pregnancy.

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"... The whole human race is rumbling on to destruction. There is only a fifty-fifty chance of getting over this food problem. If it is not solved there will be chaos in the world in the next 50 years. The nations of the world are insane, they are spending one-third of their national incomes preparing for the next war. They are applying their energies to building up a war machine instead of applying the world's steel and industrial production to conserving the resources of the land. That is the only basis of civilisation."—Sir JOHN BOYD ORR, F.R.S., reported in the *Times*, May 5, 1948.

## MATERNAL MEASLES, MUMPS, AND CHICKENPOX AS A CAUSE OF CONGENITAL ANOMALIES

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SINCE 1941 evidence has accumulated that the contraction of rubella by the mother early in her pregnancy is related to the development of congenital anomalies in her offspring. Gregg (1941) first suggested this when he reported anomalies in 78 children whose mothers had had rubella in pregnancy during an exceptionally large outbreak in Australia in 1939. This observation was extended and confirmed by Swan et al. (1943, 1944, 1946) who reported 101 similar cases, also in Australia. Since then many examples of this relationship have been reported in the United States and Great Britain.

The commonest congenital defects following maternal rubella are unilateral or bilateral cataract, heart disease, deaf-mutism, and dental abnormalities. Others reported include microcephaly, microphthalmos, hare-lip, cleft palate, pyloric stenosis, spina bifida, mongolism, and navi.

Swan et al. (1944) suggested from their findings that 100% of women contracting rubella in the first two months, and 50% of those contracting it in the third month, of pregnancy would bear children with congenital anomalies. These workers, as well as others, did not, however, cite the number of women with rubella in pregnancy whose offspring showed no congenital defects.

Fox and Bortin (1946) investigated 152 married women notified to the Milwaukee Health Department as having rubella in 1942–44. Of these, 11 had been pregnant at the time of the disease: 5 in the first two months; 4 in the third or fourth month; and 2 in the last five months. Of 12 infants born of these mothers, 1 was a hydrocephalic infant stillborn at the eighth month of pregnancy to a woman who had had rubella in the second month. Another, a full-term "blue baby," was born with hydrocephalus but subsequently recovered and became "perfectly normal." Aycock and Ingalls (1946) reported 4 cases of rubella in pregnancy: 2 in the second month; 1 in the fourth month; and 1 in the ninth month. Of 4 infants born to these mothers 1 was mentally retarded, its mother having had rubella in the second month of pregnancy.

The reporting of congenital anomalies in babies born of pregnancies in which the mothers had had rubella has naturally raised the question whether other infectious diseases, particularly those due to a virus, may cause similar defects. There have been several reports of defective children born to mothers who had had other infections during pregnancy, but, except the work of Aycock and Ingalls (1946) with poliomyelitis, we have not found any report dealing with the numerical probability of anomalies following maternal virus diseases other than rubella.

Aycock and Ingalls investigated 131 infants born of women who had had poliomyelitis in pregnancy. In 33 cases the pregnancy had ended in abortion, miscarriage, stillbirth, or death shortly after birth. Of the remaining 98 children, one had club-foot and another heart disease,

the mothers of these children having had poliomyelitis in the second and third months of pregnancy respectively.

PRESENT INVESTIGATION

Our purpose was to obtain data which would help to determine the numerical probability of certain congenital anomalies in children born of women who had had measles, mumps, or chickenpox in pregnancy. These three diseases were chosen because the cause in each case is a filtrable virus, because they are common diseases, and because in Milwaukee they are legally notifiable to the health department. These diseases are in our opinion more completely reported to the doctor and more accurately diagnosed, particularly among adults, than most virus infections. Rubella, though notifiable, is unquestionably more often erroneously diagnosed, as well as not notified, than the other three diseases. Except in its paralytic variety, poliomyelitis is also often improperly diagnosed, though the notifying of diagnosed cases is excellent. Among adults notified as having poliomyelitis the proportion who were in the abortive and pre-paralytic stages at the time of notification is considerably lower than among children. This fact suggests that poliomyelitis is not so well diagnosed, and therefore not so well notified, among adults as among children.

In the four years 1942-45 inclusive, 18,817 cases of measles, 14,914 cases of mumps, and 26,353 cases of chickenpox were notified to the Milwaukee Health Department. A review of these notifications showed that in 100 cases of measles, 356 of mumps, and 77 of chickenpox the patient was entered as "Mrs." Public-health nurses were assigned to interview these married women during the latter part of 1946. The nurses were issued with survey forms which they themselves were to fill in; no data were obtained by posting questionnaires to the women.

Spaces on the forms were provided for listing the date of birth of each child born of each mother and for recording congenital anomalies. Also recorded were the date of birth of the mother and history of measles, mumps, or chickenpox, with the date of onset, description of complications, if any, and stage of pregnancy at the time of onset. If the woman had been pregnant when she contracted one of these diseases, a record was made of the first day of the last menstrual period, whether the baby was carried to full term, the baby's birth-weight, and whether it was a live birth or a stillbirth.

Nurses were instructed by one of us in the proper manner of obtaining the desired information, after which the address of each woman as it appeared on the original notification was visited. If the woman no longer resided there, every effort was made to determine her present address through neighbours, the city directory, and post-office officials. If residence in Milwaukee could be ascertained, the interview was completed.

In 1942-46 many families moved because their husbands joined the Services or as a result of the acute housing shortage

TABLE I—FINDINGS AMONG MARRIED WOMEN NOTIFIED AS CONTRACTING MEASLES, MUMPS, OR CHICKENPOX IN 1942-45

—	Measles	Mumps	Chicken-pox	Total
(1) No. of married women ..	54	240	52	346
(2) No. with children ..	39	213	45	297
(3) No. of children born before disease ..	59	449	81	589
(4) No. of (3) with anomalies*	2(a)	3(b)	1(c)	6
(5) No. conceived and born after disease ..	12	53	11	76
(6) No. of (5) with anomalies	0	0	0	0

\* Character of anomalies:

(a) measles: one with hare-lip (familial history of hare-lip in maternal relatives) and one with heart disease.

(b) mumps: one with unilateral congenital cataract, one with congenital torticollis, and one with congenital club-foot.

(c) chickenpox: one with heart disease.

at the end of the war. Only 54% of the married women notified as having measles, 70% of those notified as having mumps, and 68% of those notified as having chickenpox were located and interviewed.

The recording of congenital defects in our study cannot be regarded as complete. No effort was made to include dental anomalies. The age of many children at the time of interview was such that few, if any, of even the deciduous teeth had erupted. Further, it was not possible to obtain adequate information about such factors as retardation of tooth eruption, hypoplasia, and defective tooth formation. Questionable degrees of mental retardation were not recorded. It was felt that many mothers would consciously or unconsciously deny the existence of mental retardation unless it was obvious. Such things as feeding difficulty, malnutrition, sleeplessness, and nervous irritability were also not recorded because they do not readily lend themselves to simple analysis.

The nurses were instructed to pay special attention to the reporting by the mother of all congenital abnormalities; to inquire specifically for cataract, deafness, heart disease, cleft palate, and hare-lip; and to record all conditions mentioned by the mother as congenital

TABLE II—FINDINGS AMONG MARRIED WOMEN WHO WERE PREGNANT WHEN THEY CONTRACTED MEASLES, MUMPS, OR CHICKENPOX IN 1942-45

—	Measles	Mumps	Chicken-pox	Total
No. of women .. ..	6	23(a)	4	33
No. who gave birth to live infants .. .. .	6(b)	22	4	32
No. of children still alive ..	7	22	4	33
No. with defects .. ..	1(c)	0	0	1

(a) One pregnancy ended in spontaneous abortion at two months; (b) including a pair of twins; (c) hare-lip.

anomalies as well as all cases of deafness or heart disease, without trying to determine whether these were in fact congenital.

One of us subsequently examined each child listed by the nurses as having an anomaly or any deafness or cardiac disorder. Many children proved on examination not to have congenital anomalies. For example, most of the reported heart conditions were rheumatic, and in all the cases of impaired hearing a conduction deafness resulting from otitis media was found, none showing evidence of congenital deafness.

FINDINGS

Table I shows the number of married women interviewed who had had measles, mumps, or chickenpox in 1942-45, together with the number who had given birth to live infants. The number of live births before one of the three diseases had been contracted was 589. The number of children with anomalies in this group was 6. These same women had borne 109 live children after recovery from their virus disease. Of these 109 live children, 33 had been born of pregnancies in which the mother had had one of the three virus diseases. The remaining 76 children had been born of pregnancies which had begun after the mother had recovered from one of these diseases; there were no anomalies among these 76 children.

The number of children born of mothers who did not have any of these virus diseases during pregnancy was 589+76, or 665, among whom there were 6 with congenital anomalies. The "normal" incidence of congenital anomalies was therefore 0.9%.

The absence of anomalies among the 76 children whose mothers had had one of the three diseases before conception suggests that children conceived from a few weeks to four years after the mother has recovered from measles, mumps, or chickenpox are no more likely to have anomalies than are those born before such infections.

Table II sets out the findings among the mothers who had measles, mumps, or chickenpox in pregnancy. Only 1 of the 33 children born to these mothers had a congenital anomaly. There were no defects in 22 children born after mumps in the mother, and none in 4 children born after chickenpox in the mother. Of 7 children born after maternal measles 1 had a unilateral hare-lip.

In table III the 33 live births to mothers who contracted measles, mumps, or chickenpox while pregnant are shown in relation to the month of gestation in which the disease appeared. Though 3 children were born after mumps in the first two months of pregnancy, and 7 after mumps in the third and fourth months of pregnancy, there were no congenital anomalies. No children were born after chickenpox in the first two months of pregnancy, and only 2 after chickenpox in the third and fourth months of pregnancy; neither of these had an anomaly. The only anomaly in the series was the unilateral hare-lip in a child whose mother had measles in the fourth month of pregnancy. The only child born after measles in the first two months of gestation had no anomaly.

TABLE III—DISTRIBUTION OF CHILDREN ACCORDING TO MONTH OF PREGNANCY IN WHICH MOTHERS DEVELOPED DISEASE

Disease	Month of pregnancy									Total
	1	2	3	4	5	6	7	8	9	
Measles ..	1	..	..	1(a)	5(b)	..	..	..	..	7
Mumps ..	2	1	3	4	4	3	2	2	1	22
Chickenpox	..	..	1	1	2	..	..	..	..	4

(a) Hare-lip; (b) includes a pair of twins.

No anomalies occurred among 8 children born of mothers who contracted measles, mumps, or chickenpox in the first three months of pregnancy. Of the 19 children whose mothers contracted one of the three diseases in the second three months of pregnancy 1 had an anomaly. Of 6 children born of mothers who contracted one of the diseases in the third three months of pregnancy none had an anomaly.

Table IV compares the incidence of congenital anomalies in children born of pregnancies in which the mothers contracted one of several virus diseases. This table summarises the experience of workers who have tried to determine the numerical probability of congenital anomalies in the offspring of mothers who contract virus diseases during gestation.

#### DISCUSSION

The development of congenital anomalies in babies born of mothers who have had virus diseases in pregnancy is worthy of intensive investigation. Many of the reported anomalies are extremely serious. Some of them, such as hydrocephalus and certain types of congenital heart disease, usually lead to serious disability and premature death. Most of the more significant anomalies impose severe financial handicaps on the parents. The community burden is often great because the afflicted children commonly need institutional care, special and costly educational facilities, frequent treatment in hospital or otherwise at public expense, and in some cases, such as the blind and the deaf, financial aid. The extent and true significance of the psychic trauma suffered by those having anomalies, as well as by their parents and siblings, is incalculable.

To assess the extent of this problem of anomalies occurring in the offspring of mothers who contract various virus diseases in pregnancy, several hitherto unknown facts must first be ascertained. These unknown facts include the percentage of children with congenital defects in the population at large, as well as an analysis of the various anomalies.

A second unknown fact is the percentage of children with anomalies born after pregnancies complicated by virus diseases, analysed according to the variety of virus infection, the period of gestation at the time of the disease, and the type of anomaly resulting. Obviously it is important to know which diseases may result in an abnormal proportion of offspring with anomalies, what the numerical probability is for any given disease in relation to the period of gestation, and the character of such anomalies.

We have tried to determine the incidence of congenital anomalies in children born of mothers who had not, so far as could be determined, suffered from any notifiable virus disease in pregnancy. The children in this group were born of mothers who had measles, mumps, or chickenpox in 1942-45 but they were either born before the onset of the disease or were conceived and born after the disease was over. The incidence of anomalies in these children was 0.9%, but dental abnormalities and slight mental retardation were not considered.

Several reports dealing with congenital defects following maternal rubella suggest that an extremely high percentage of babies have the more serious anomalies, particularly if the mother has had the disease in the first four months of pregnancy. Unfortunately, the approach of most workers to this problem has not permitted a determination of the numerical probability of such defects.

Taking the results of Fox and Bortin (1946) and Aycock and Ingalls (1946) (see table IV), who approached the problem from a numerical probability basis, we find that of 15 children born of mothers who had had rubella in pregnancy 2 (13%) had anomalies; this is about fifteen times the expected rate of 0.9%. The same workers reported that of 12 children born of mothers who had had rubella in the first four months of gestation 2 (17%) showed anomalies; this is more than eighteen times the normal rate.

Aycock and Ingalls (1946) (see table IV) reported that of 98 children born of mothers who had had poliomyelitis in pregnancy 2 (2%) had anomalies, which is about twice the normal rate. The 2 children with anomalies were among the 24 born of mothers who had had poliomyelitis in the first four months of pregnancy, so in this group the incidence of anomalies was 8%, or nine times the normal rate.

In our experience with measles 1 child with a congenital anomaly was found among 7 whose mothers had had measles in pregnancy; this is 14%, or more than fifteen times the normal. The one anomaly occurred among 2 children whose mothers had had measles in the first four months of pregnancy, giving an incidence of 50%, or

TABLE IV—ANOMALIES FOLLOWING MATERNAL VIRUS DISEASES BY PERIOD OF PREGNANCY

Disease	Source of data	Period of pregnancy	No. of children	No. with anomalies	Proportion with anomalies
Rubella	Fox and Bortin (1946)	1st 4 mos.	9	1	1 in 9
		5 mos. and after	2	0	0
Rubella	Aycock and Ingalls (1946)	1st 4 mos.	3	1	1 in 3
		5 mos. and after	1	0	0
Poliomyelitis	"	1st 4 mos.	24	2	1 in 3
		5 mos. and after	74	0	0
Measles	This paper	1st 4 mos.	2	1	1 in 2
		5 mos. and after	5	0	0
Mumps	"	1st 4 mos.	10	0	0
		5 mos. and after	12	0	0
Chickenpox	"	1st 4 mos.	2	0	0
		5 mos. and after	2	0	0
None ..	"	..	665	6	1 in 111



fifty-five times the normal. However, our measles series is obviously too small to warrant any statistical interpretation on the basis of probability. The single anomaly might well be a chance occurrence. On the other hand, it does emphasise the need for further investigation of possible relationship between maternal measles and anomalies in the offspring.

Our failure to find any case with an anomaly among 22 children whose mothers had had mumps while pregnant, even though in 10 cases the disease had occurred in the first four months of gestation, is of interest. No general inference can be drawn from so small a series. It does suggest, however, that if there is any relation between maternal mumps and anomalies in the offspring it is probably less constant than for rubella and possibly less than for either poliomyelitis or measles.

Our chickenpox series of only 4 cases is not open even to hypothetical interpretation. None of the mothers had had the disease in the first two months of pregnancy, and 2 had contracted it in the first four months; there were no anomalies.

The possibility of congenital anomalies in babies born of mothers who have had rubella before conception has been raised. Gregg (1941) described a case of congenital cataract in which the mother had had rubella three months before conception. Swan et al. (1946) noted 2 mothers who had rubella with onset fifteen and six days before conception. The first gave birth to a normal child, while the second was submitted to a therapeutic abortion at three months of pregnancy and the foetus seemed normal. Hall (1946) reported a case of congenital cataracts, deafness, and heart disease in a child whose mother is supposed to have had rubella six weeks before conception. Wesselhoft (1947) mentions that Sweet, in a personal communication to him, reported a woman who had contracted rubella ten days before conception and given birth to an infant with bilateral cataracts, patent ductus arteriosus, and hydrocephalus. In our study we located 76 children born of pregnancies in which conception had taken place from three weeks to slightly more than four years after onset of measles, mumps, or chickenpox, and there were no anomalies.

Though the need for further investigation is apparent, we are inclined to believe that, when conception takes place subsequent to recovery from measles, mumps, or chickenpox, there is no significant relation between these diseases in the mother and the development of anomalies in the offspring.

We are fully aware that our series is too small for definite conclusions to be drawn. We hope that others will investigate the occurrence of anomalies in the normal population, as well as in the children of mothers who have had virus diseases in pregnancy. Epidemiologists could visit married women notified as having virus diseases to verify the diagnosis and ascertain whether there is a coexistent pregnancy. Birth and stillbirth certificates could then be checked against a file of such cases, with the epidemiologist visiting and examining living children as soon as possible after birth and at yearly intervals for at least the next four years. Through such an approach it would be possible to accumulate sufficient data to determine the true numerical probability of the development of anomalies in relation to type of disease, character of anomaly, and period of gestation.

The number of pregnant women with so-called "childhood contagious diseases" will be proportionately higher in small towns and rural areas than in the large urban centres. Almost all notified cases of chickenpox and measles in adults in Milwaukee occur in persons who migrated to the city during their adolescent or adult age. It is difficult to escape infection with these diseases if one lives in a large city from infancy to adulthood. Mumps more often occurs in adults who have lived in Milwaukee since early childhood than does chickenpox or

measles. Nevertheless the mumps case-rate among urban adults is lower than that among those living in rural areas. German measles is not infrequently seen in adults who have been reared in Milwaukee, probably because epidemics of this disease have occurred at intervals of about 6-10 years, in contrast to the general endemicity of chickenpox and the triennial occurrence of measles epidemics. The rubella case-rate among adults is nevertheless lower in urban centres than in rural areas. Consequently the problem of anomalies should be investigated in rural as well as urban areas, if the data required for sound statistical interpretation are to be accumulated as rapidly as possible.

#### SUMMARY

All notifications of measles, mumps, and chickenpox to the Milwaukee Health Department in 1942-45 were examined, and as many as possible of the married women who had had these diseases were interviewed to determine the incidence of congenital anomalies among their offspring.

Among 297 mothers 589 children were born before, and 76 were conceived and born after, the mothers had had measles, mumps, or chickenpox in 1942-45. The incidence of anomalies in this group of 665 children was 0.9%.

Of 33 live children born to the same number of married women who had measles, mumps, or chickenpox while pregnant, 1 had a congenital anomaly. One pregnancy ended in spontaneous abortion in the second month. None of 22 children born of pregnancies complicated by mumps and none of 4 children born of pregnancies complicated by chickenpox showed congenital defects; but 1 of 7 children born of pregnancies complicated by measles had a unilateral hare-lip.

The reports of other workers on anomalies following maternal rubella in pregnancy indicate an over-all incidence about fifteen times the expected rate of 0.9%, and in the case of mothers who had had rubella in the first four months of gestation more than eighteen times the expected rate.

For poliomyelitis in pregnancy the over-all incidence for anomalies is about twice the expected rate, and in the case of poliomyelitis in the first four months of pregnancy nine times the normal rate.

There is no evidence that when conception takes place subsequent to recovery from measles, mumps, or chickenpox there is any relation between these diseases and the development of anomalies in the offspring.

The need for further investigation to determine the true numerical probability of the development of anomalies of various types in relation to the type of virus disease contracted by the mother and the period of gestation during which the disease occurred is emphasised.

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"... Social medicine is a philosophy rather than a subject. It seems to me that it is a facet, and an important facet, of the belief that medicine should no longer be taught or practised from a negative outlook. . . . It is doubtful whether the estimable zeal for the specialised viewpoint inculcated during several years of training by the various specialist teachers . . . can be counterbalanced by even a long period at the feet of the most eminent professor of social medicine. What one would like to see is a frank prohibition on students studying anything (in their medical course) which is divorced from its context. When the student is walking the wards . . . he should not be permitted to view a patient as he might view a specimen in a pathological museum."—Dr. WILLIAM P. FORREST, at Atlantic City, on April 18.

## AVULSION FRACTURE OF LESSER TUBEROSITY OF HUMERUS

REPORT OF A CASE

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AVULSION fracture of the lesser tuberosity of the humerus does not seem to have been reported before, nor do the well-known textbooks refer to it. The first case encountered in my experience of well over 25,000 fractures is reported here with all the detail that could be gathered from clinical study of the case over fourteen months (from August, 1944, to October, 1945).

A woman of 56, while out riding, dismounted from side-saddle to walk her horse past a slippery patch. As she touched ground her leading foot slipped. She tried to save herself by retaining a grip on the saddle post with her right hand. Instantly she suffered severe sickening pain "deep in the shoulder," shooting up the neck. She was forced to let go at once. The right arm was powerless, but she walked her horse back three miles to her hotel, where the staff surgeon found her in great pain with a very swollen and powerless shoulder.

Six days later the shoulder was still swollen, painful, and stiff in spite of local treatment, and the patient was sent down to be seen by a surgeon.

On examination two weeks after the accident, the right shoulder presented a global appearance, flattened on top where the acromion process indented the swelling. Deep tenderness was well marked over the front and medial aspects of the head of the humerus. The swelling was formed by an infiltration of the axillary tissues and the deltoid with, deep to this, a fluctuant swelling conforming to the limits of the joint capsule.

The arm hung by her side and was apparently powerless at the shoulder. The elbow could be flexed and extended, and radio-ulnar supination and pronation were present and full, in extension and in flexion, at the elbow. Abduction, however, was impossible and caused sharp pain "deep in the shoulder." Active internal and external rotation of the humerus on the scapula were absent, but passively internal rotation caused very little pain compared with external rotation.

Radiography showed an avulsion fracture of the lesser tuberosity, with increased density of the detached fragment of bone (fig. 1). The loose portion appeared to be lying inferoposteriorly to the head of the humerus (fig. 2).

The patient was now complaining bitterly of the last four nights being disturbed by neuralgic pain located mostly at the middle of the outer surface of the right arm and extending up over the point of the shoulder into the neck.

*Treatment.*—The arm was placed upon a light splint of Cramer wire at an angle of 45° abduction, with 25° forward flexion and mid-internal rotation at the shoulder.

A week later the infiltration of the deep tissues surrounding the shoulder had sufficiently subsided to allow palpation of the joint structures. It was at once realised that the right deltoid was flaccid and wasted. With the arm on the abduction frame at 45° no power at all could be demonstrated in the deltoid. When the arm was raised to 90° with the patient flat on her back on the floor, a faint stiffening could be made out in the muscle on directing the patient to attempt to raise the arm.

The capsule still contained fluid, and fluctuation could easily be made out. Deep tenderness over the head was located accurately to the site of the lesser tuberosity. On passive abduction of the arm a soft fluctuant swelling appeared under the right deltoid. An aspirating needle introduced into the joint under the acromion withdrew syrupy brown-black fluid—the remains of a hæmarthrosis.

When the position was explained to the patient she refused to allow any attempt to replace the avulsed insertion of subscapularis. The arm was therefore put up on a Cramer frame with the shoulder abducted to 90° and the frame turned down almost into the sagittal plane of the body to give internal rotation. Daily active exercises were conducted in which she was taught to individualise her shoulder muscles. All other muscles were exercised freely.

A month later the deltoid was contracting visibly and had regained a large part of its tone. Power was represented at this point by the arm being lifted off the splint from 80° to 90°—i.e., through 10° abduction against gravity—and held there by deltoid alone. Two weeks later the "power angle" had increased by 20°, and at the end of two months she could rapidly and easily lift the arm through 45° to full abduction and maintain this position against a 2 lb. weight on the elbow.

From this point the patient resumed duty as a V.A.D. worker doing heavy nursing in one of the surgical wards under my care. No complaint was made by the patient from this time. Examination from time to time revealed complete return of deltoid power and no disability except loss of internal rotation of the humerus on the scapula. This defect has persisted without development of any compensatory trick movement. The disability is slight, does not prevent the patient from playing a good game of golf, riding hard, and generally making the best of life.

A radiogram taken in October, 1945, showed complete absorption of the small fragment of the lesser tuberosity. A slight irregularity persists as evidence of the injury at the original site of the small tuberosity (fig. 3).

### DISCUSSION

It is clear how the fragment of bone torn away from the humerus would whip down and contuse the circumflex nerve besides bruising the neighbouring blood-vessels. The hæmarthrosis was probably due to rupture of the edge of the capsule and synovia as the lesser tuberosity with its attachments parted company with the humerus.

A surgical colleague has suggested that the whole sequence of events could have been initiated by a



Fig. 1.—Radiogram showing avulsed fragment of lesser tuberosity of humerus. Note increased density of detached fragment.



Fig. 2.—Radiogram showing detached fragment lying apparently inferoposteriorly to the head of the humerus.



Fig. 3.—Radiogram, taken fourteen months after injury, showing absorption of detached fragment and slight irregularity at site of injury.

momentary dislocation of the shoulder. This is entirely reasonable, since it would explain the conspicuous signs found some time after the accident, whereas so trivial an accident as the tearing off of a flake of bone at the insertion of a muscle alone does not explain them. The neurapraxia might be the result of direct contusion by the bone fragment or of stretching during the dislocation.

It therefore seems probable that the fracture occurred in the course of a momentary dislocation of the shoulder caused by severe voluntary effort in the hyperextended, hyperabducted, and mid-intero-external rotation position. In this position the subscapularis would contract to its greatest advantage, since its pull would be a straight line from origin to insertion.

The violence of the accident and the gross clinical signs and complications are in contrast with the minor residual disability. Whether the latter could have been overcome satisfactorily by surgical interference, or whether the effects of the operation necessary for the exposure of the damaged tuberosity would have limited the extent of the recovery even further, is a point which cannot be cleared from this single experience.

#### SUMMARY

A case of avulsion fracture of the lesser tuberosity of the humerus is reported. It appears to be a rare injury.

It was caused by an effort with the arm fully abducted above the shoulder, the hand being fixed and the body moving, to save a fall on dismounting from side-saddle on a horse.

The circumflex nerve was contused and hæmarthrosis developed.

Operation was refused by the patient.

Recovery was complete except for internal rotation at the scapulohumeral joint, which has never been regained.

[The fragment of bone avulsed first underwent aseptic necrosis and then was absorbed in fourteen months.

## EXOPHTHALMIC OPHTHALMOPLÉGIA

TREATED WITH PROSTIGMIN

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OPHTHALMOPLÉGIA has been a well-recognised complication of thyrotoxicosis and of thyroidectomy since the association was first described by Naumann in 1853. A case is here reported in which an exophthalmic ophthalmoplegia followed subtotal thyroidectomy for Graves's disease, in association with unilateral regression of the preoperative exophthalmos and with rapid relief from all other signs of thyrotoxicosis. The condition has so far been controlled by daily injections of 'Prostigmin.'

A married woman, aged 33, was admitted to hospital with ten months' history of loss of weight, nervousness, and palpitations. A divergent squint had been present for some years, but the eyes had begun to protrude only during the last two months. The patient presented the typical clinical picture of primary exophthalmic goitre: a moderate smooth bilateral enlargement of the thyroid gland, with a pronounced bilateral exophthalmos; resting pulse-rate 120 per min.; blood-pressure 140/70 mm. Hg; basal metabolic rate + 57. There was also healed bilateral apical tuberculosis.

After the usual preoperative preparation a subtotal thyroidectomy was performed on Nov. 25, 1946, seven-eighths of each lobe being removed. Next day a right-sided pleurisy developed, which cleared rapidly under systemic penicillin. Further convalescence was uneventful.

At a routine follow-up on March 3, 1947, the patient complained of headaches and diplopia. She was found to have a bilateral proptosis, the left side being worse than the right.

There was diplopia on looking to the right, left, or upwards, but not straight ahead. Right and left elevation were very definitely defective but not equally so, the right being more so than the left. Vision with glasses was 6/12 and 6/9. There was some general oedema of the conjunctiva on both sides. The right eye was intermittently divergent. The left eye showed a greater degree of protrusion than in the very early stages of convalescence. The right eye was unchanged in this respect. At this examination the patient showed no evidence of thyrotoxicosis; the resting pulse-rate was down to 75, and she had put on half a stone in weight. Exophthalmic ophthalmoplegia was diagnosed, and a régime of daily injections of prostigmin 0.125 g. was instituted.

The improvement in the general condition of the eyes was considerable. At a further examination on May 5, 1947, the right eye appeared normal. The left eye showed some protrusion but much less than two months previously. There was good elevation in both eyes, and all ocular movements were full. There was no conjunctival oedema. Diplopia was elicited only on looking to the extreme right and upwards. The general appearance of the eyes was good. Divergence could be elicited by the cover test on the right eye and the synoptophore showed both an error of divergence and a hyperphoria, but both of these binocularly could be fairly well controlled. In view of this improvement the dose of prostigmin was reduced. After two weeks it became evident that the left eye had become more protuberant, and the original dose was restored. The proptosis then again subsided.

The prostigmin was stopped on Dec. 3, 1947. On Jan. 7, 1948, the proptosis appeared to have decreased a little again. The function of the eye appeared to be otherwise within normal limits. There was still considerable widening of the palpebral fissure but no evidence of thyrotoxicosis was detected.

#### DISCUSSION

The term exophthalmic ophthalmoplegia was introduced by Russell Brain (1937), who gave this name to the case where the thyrotoxicosis and the exophthalmos appear to be independent variables, the hyperthyroidism in itself not producing the exophthalmos or aggravating an exophthalmos produced by some other factor. The condition usually follows operation for thyrotoxicosis, and gross cases of exophthalmos have been recorded in the presence of myxœdema. Patterson (1934) has shown that enormous doses of thyroid may be administered without producing exophthalmos. Smelser (1937), on the other hand, produced exophthalmos in thyroidectomised dogs by injection of the thyrotropic hormone of the pituitary gland. The exophthalmos persisted after death. Brain (1937) recorded seven cases of unilateral ophthalmoplegia where the exophthalmos was bilateral. In his cases the degree of ophthalmoplegia was greater in the eye showing the greater degree of exophthalmos. In the present case the eye showing no exophthalmos was the more affected. In Brain's cases prostigmin was ineffective.

If the exophthalmos is produced by the thyrotropic hormone of the pituitary gland, there is no rational basis for the use of prostigmin. The association of myasthenia and exophthalmos has been recognised, and such an entity as thyrotoxic myasthenia postulated by Mulvany (1943). It is even theoretically possible that two factors are at work, the one responsible for the exophthalmos and the other for paresis of the ocular muscles.

#### SUMMARY

A case of exophthalmic ophthalmoplegia is recorded. The paresis was greater in the eye showing no exophthalmos.

The paresis responded to prostigmin.

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## Preliminary Communication

### A GROWTH-RETARDING FACTOR IN MAIZE BRAN

ONE of the salient features of endemic pellagra is its association with consumption of maize as a staple cereal.

Aykroyd and Swaminathan (1940, 1941) showed that this is not adequately explained by a simple deficiency of nicotinic acid. Stockman and Johnston (1933) claimed to have isolated toxic organic acids from maize and some other cereals, and Woolley (1946) isolated what is believed to be a basic toxin from whole maize. Krehl and his associates (1946) retarded the growth of rats by adding maize to the diet; they suggested that the effect was analogous to that of non-maize diets containing tryptophane-free proteins and was caused by an imbalance of amino-acids. Salmon (1947b), however, found that de-germinated de-husked maize grits had no specific effect in his feeding trials, though his diet was very similar to that used by Krehl et al. and by Woolley.

In 1947 two of us (J. C. W. and R. A. W.) made a brief inquiry into an apparent increase of pellagra during the last ten years in Basutoland, South Africa, and found some evidence that this increase was related to an increase in consumption of maize bran resulting from changes in milling practice.

Feeding tests have now been made with maize bran and maize flour (practically free from bran) procured by us in Basutoland. Since the harmful effect of maize has only been demonstrated on diets poor in protein and nicotinic acid, we have kept our values of protein and nicotinic acid as low as is consistent with reasonable growth in the control animals. At the same time we have tried to test the relative merits of the amino-acid imbalance and toxicity theories by avoiding to some extent an amino-acid imbalance in the diets. This was done by adding *dl*-tryptophane to the maize diets to make the amounts of the biologically active isomer equal in both control and test diets.

#### EXPERIMENTAL

Diets were designed to have 10% protein, 4.3% crude fibre, and adequate salts and vitamins. The balance was made up by the addition of refined maize starch, pre-cooked, dried, and ground; 4% oil was added to supply essential fatty acids.

The salt mixture was no. 5 of Salmon (1947a). A mixture of B-complex vitamins was incorporated into a "master mix" of pre-cooked dried maize starch and added to the diets to give the following amounts of vitamins per kg. of diet:

Vitamin B <sub>1</sub> .. .. .	2.0 mg.	Choline .. .. .	1000 mg.
Riboflavine .. . . .	3.0 mg.	Inositol .. .. .	100 mg.
Pyridoxine .. . . .	2.5 mg.	Biotin .. .. .	0.1 mg.
Calcium pantothenate	20 mg.	$\alpha$ -Tocopherol acetate	10 mg.

Cod-liver oil 10 g., containing 1 mg. of 2-methyl-1:4-naphthoquinone, and deodorised maize oil 30 g. were added to 1 kg. of diet.

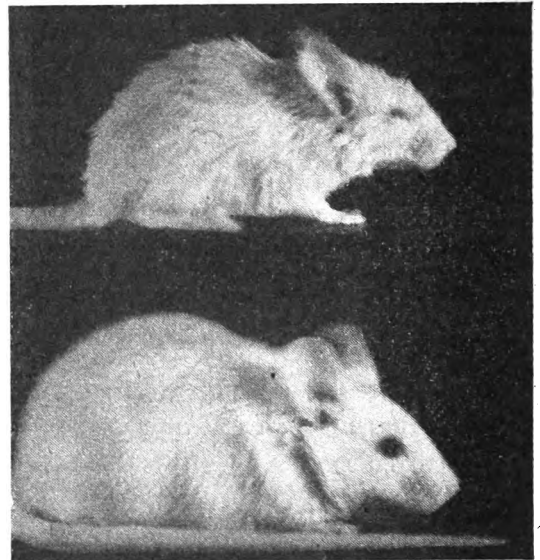
Excluding the oil, the diets were made up as follows, in g. per kg. of diet, except for tryptophane, which is in mg.:

	Standard diet	10% bran diet	Flour diet
Cellulose flour .. .. .	47	34	42
Casein .. .. .	117	110	58
Salts .. .. .	41	41	41
Vitamin starch .. .. .	94	94	94
Maize starch .. .. .	701	626	200
Maize bran .. .. .	—	95	—
Maize flour .. .. .	—	—	565
	1000	1000	1000
<i>dl</i> -Tryptophane .. .. .	—	77 (mg.)	496 (mg.)
Oil .. .. .	40	40	40

Analysis and computation gave the following figures in g. per 100 g. of diet as used, except for nicotinic acid, where the figures are in mg.:

	Standard diet	10% bran diet	Flour diet
Nitrogen .. .. .	1.59	1.60	1.59
<i>l</i> -Tryptophane .. .. .	0.103	0.104	0.104
Crude fibre .. .. .	4.43	4.33	4.30
Fat .. .. .	4.21	4.73	5.99
Nicotinic acid .. .. .	0.118 (mg.)	0.368 (mg.)	0.860 (mg.)

The animals used were weaning albino mice from an inbred strain either kept at these laboratories or obtained from another source, from which our own strain is derived. Litters were divided equally by sexes, between the control and test diets, odd mice being rejected. Feeding was ad libitum. Weights were recorded individually twice weekly. The figures for weight gains have been analysed by the "t" test. The mean cumulative weight gains on the various diets are compared with those of litter-mates of the same sex on the standard diet, and the value of *P* for the difference between the means is determined. These values at weekly intervals are recorded in the accompanying table.



Litter-mates after 6 weeks on experimental diets: upper mouse, 10% bran diet; lower mouse, standard diet. Note smaller size and unkempt appearance of mouse fed on 10% bran diet.

#### DISCUSSION

Comparison of growths on the 10% bran diet and the standard diet show that the former are significantly lower throughout. On the standard diet weight gains are more or less uniform over the 6 weeks, but on the bran diet, after a gain for 3 weeks, which is less than that on the standard diet, there is a considerable loss in weight, culminating in some deaths. Apart from the reduced rate of growth and the subsequent loss in weight, all the animals on the bran diet developed an unkempt appearance, unlike the normal healthy appearance of those on the standard diet. The photograph of litter-mates on bran and standard diets shows this difference (see figure). Though some mice showed weight gains almost equal to those shown by litter-mates on the standard diet they nevertheless had the unkempt appearance. Moreover, when at the end of a 6-week experimental period 5 mg. of nicotinamide per 100 g. was included in the bran diet, the unkempt appearance vanished within 2 weeks, but no appreciable gain in weight took place in a further period of 8 weeks on the supplemented diet. The weight loss may be a

MEAN CUMULATIVE WEIGHT GAINS IN G. PER MOUSE.

Weeks .. ..	1	2	3	4	5	6	7	8
Standard diet .. ..	1.83	5.14	6.72	7.75	8.79	11.43	..	..
10% bran diet .. ..	-0.07	2.39	3.24	1.62	1.22	0.50	..	..
P for difference .. ..	< 0.001	> 0.01 < 0.02	< 0.001	< 0.001	< 0.001	< 0.001	..	..
No. of mice on each diet .. ..	18	18	18	14	14	7	..	..
Standard diet .. ..	0.50	2.50	4.12	5.75	7.50	8.50	8.37	10.12
Flour diet .. ..	2.62	6.62	7.12	9.25	11.37	13.62	16.37	19.87
P for difference .. ..	> 0.02 < 0.05	> 0.02 < 0.05	< 0.1 > 0.05	< 0.3 > 0.2	< 0.2 > 0.1	< 0.2 > 0.1	< 0.1 > 0.05	< 0.1 > 0.05
No. of mice on each diet .. ..	4	4	4	4	4	4	4	4
Standard diet .. ..	1.8	2.7	5.2	7.4	..	..	..	..
10% bran diet + 5 mg. nicotinamide per 100 g. .. ..	1.9	2.3	4.4	6.0	..	..	..	..
P for difference .. ..	< 0.5 > 0.4	< 0.9 > 0.8	< 0.8 > 0.7	< 0.8 > 0.7	..	..	..	..
No. of mice on each diet .. ..	5	5	5	5	..	..	..	..

manifestation of permanent damage, at present of unknown nature.

On the maize-flour diet growth was good and regular. Mean values of gains were uniformly higher than those of the controls on the standard diet, but after the first 2 weeks the differences just did not reach a significant figure. Only 4 mice were on this diet. It is to be expected that repetition with a larger number of mice would show a statistically significant difference.

Analyses of the diets show that the maize-flour diet had appreciably more nicotinic acid than the standard diet (0.86 mg. per 100 g. against 0.1 mg. per 100 g.) and more fat (5.99% against 4.21%). This may explain the better growth. The effect of adding this extra amount of fat and nicotinic acid to the basal diet needs investigation.

That the bran effect is preventable by nicotinic acid is shown by the absence of a significant difference between the mean weight gains over a period of 4 weeks for mice on standard diet and litter-mates on 10% bran plus 5 mg. of nicotinamide per 100 g. This amount of nicotinamide may well be considerably higher than is needed to overcome the bran effect.

From the published data on the amino-acid composition of various proteins it does not seem likely that the addition of the small amount of protein in maize bran to 16 times its weight of casein could produce a degree of amino-acid imbalance that would affect growth. The changes seen in animals consuming our bran diet therefore demonstrate, we believe, the presence of a toxic factor in the bran. This belief needs to be tested critically by extraction of the toxin. Up to now we have tried the extraction method described by Woolley (1946), given more fully in a personal communication to Prof. B. S. Platt, and the method described by Kodicek et al. (1947). We are not yet satisfied that the toxicity of the extract prepared by Woolley's method in our hands is not due to residual solvent. We have found great difficulty in removing the last traces of chloroform used in the extraction, and necropsy shows lesions resembling those produced by chloroform. Kodicek's acetone-water extraction leaves the bran still toxic, in that growth is retarded when the extracted bran is included in a diet, but the unkempt appearance is missing. We intend to amplify these results later.

The absence of a toxic effect in the flour diet indicates either that the particular toxin is lacking in the flour or that the effect cannot be produced in the presence of 0.86 mg. of nicotinic acid per 100 g. This latter explanation seems unlikely, since Krehl et al. (1946)

have shown the growth-retarding effect of the inclusion of 40% yellow maize in diets containing 0.9 mg. of nicotinic acid per 100 g. Removal of the nicotinic acid from the flour without risk of other alterations is likely to prove impossible. A definite decision on the presence of a toxic factor in flour must therefore await an alternative method of assaying it.

#### CONCLUSION

The evidence that maize bran contains a toxic substance with a powerful growth-retarding action when fed at a 10% level in the diet indicates that part, if not all, of the growth retardation observed on the addition of maize to animal diets is attributable to the bran. It is possible, therefore, to explain the failure of Salmon (1947b) to retard growth by the addition of de-husked maize grits. These grits would not contain bran, whereas the whole ground maize used by other workers would contain about 5% bran. Maize grits of unspecified nature used by other workers may or may not have contained bran, according to whether the miller carried out a de-husking process before crushing.

Great caution must be used in applying to man results of experiments on laboratory animals. Retardation of growth in mice has no necessary relevance to human pellagra. It is, however, clearly of great practical importance to determine whether maize bran contains a factor toxic to man, and whether such a factor bears any relation to human pellagra. Work on these lines is contemplated.

Our thanks are due to Prof. B. S. Platt for his help and interest in the work, and to several millers in Basutoland and South Africa who provided samples. We are indebted to officials of the Basutoland Government for packing and dispatching the samples.

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## Reviews of Books

### Genetics, Medicine and Man

H. J. MULLER, Indiana University; C. C. LITTLE, Roscoe B. Jackson Memorial Laboratory; L. H. SNYDER, Ohio State University. New York: Cornell University Press. London: Oxford University Press. 1947. Pp. 158. 12s. 6d.

THIS is a collection of six of the Messenger lectures, two by each author. The standard, set by Dr. Muller, is high. His exposition of the fundamentals of genetics is among the most lucid and accurate of modern accounts. Besides describing meiosis and mitosis, he surveys the problems of the relation of the gene to viruses and the nature of mutations. Dr. Little deals mainly with the interaction of genetic constitution and environment, much of his material being drawn from mouse genetics. The effects of sex differences, age, tumours, and infectious diseases are discussed. The section on human heredity, by Dr. Snyder, though an excellent introduction for medical readers, suffers unavoidably in comparison with the earlier part of the book, in that the basic facts are less satisfactorily systematised. Dr. Snyder's separate grouping of some outstanding classes of hereditary characters, such as lipoidoses, the anæmias, and serological types, is useful and could be extended; but some of the ideas he carries over from animal genetics—such as penetrance, expressivity, and viability—may not be valid when applied to human clinical data. The discussion of linkage in man is dogmatic and goes beyond certain knowledge. Altogether, however, the essays are an excellent and stimulating piece of work by a fine team.

### Voluntary Social Services since 1918

HENRY A. MESS, late reader in sociology, University of London, in collaboration with others. London: Kegan Paul. 1948. Pp. 255. 21s.

To a future historian of social developments this volume of descriptive essays will prove a valuable handbook. Its chapters cover such fields as social service with the unemployed, voluntary case-work societies, work with the National Council of Social Service, work among boys and girls, and adult education, and conclude with a discussion on the training and recruitment of social workers. The broad theme is well described in a quotation from the *Social Service Review*: "the old-fashioned conception of social work as an effort to help other people must give place to a new conception of social service as the common effort to achieve social well-being." The authors recognise weaknesses in the training now provided for the social worker. A rather narrow sectionalism leads to "a number of misfits in high places in social work," and the outstanding need of the moment is a Bureau of Social Service to act as an employment agency. This, it is suggested, would increase the flexibility of the social-service labour market and help to narrow the gulf separating the rank and file from the higher administrative and policy-making jobs.

### Psychologie der suggestie en autosuggestie

*Een signifiësch-psychologische uiteenzetting voor psychologen en artsen.* Dr. BERTHOLD STOKVIS, director of the laboratory of experimental psychology, psychiatric clinic, Royal University of Leyden. Lochem: de Tijdstroom. 1947. Pp. 266. Fr. 15.

THE author has set himself the task of elucidating the psychological nature of suggestion and auto-suggestion by means of a method of logical analysis developed in Holland: Professor Mannoury, a leader of the movement, writes an introductory account of it here, stressing the synthetic as well as the analytic aim of this critical study of concepts. Dr. Stokvis is a pupil of Professor Carp, of Leyden, and accepts his modified version of the Freudian schematic structure of personality. He attributes much importance to "psychic resonance," which is the influence unintentionally exercised by one person on the less conscious parts of the personality of the other. Diagrams illustrate the relationship of this to deliberate suggestion and to suggestion that is consciously accepted or rejected. The first three chapters of the book deal with the terminology, elements, and forms of suggestion: then come two chapters on the psychological stages of the process and the factors

which oppose or favour suggestion; the last three chapters state the limits of suggestion and the changes of consciousness that occur in it, with some brief comments on mass-suggestion. Dr. Stokvis is erudite and his analysis is penetrating: but though he is the director of a laboratory of experimental psychology, he seems curiously indifferent to the experimental data that bear on his thesis: the work of Clark Hull and his associates, for example, is apparently known to him only from a short article, and Dr. Stokvis's own investigations, reported in the case of a deserter studied by him and Fortanier, are rather inadequate from the psychological standpoint. It is doubtful whether a logical and semantic approach can do as much towards clarifying the concepts and problem of suggestion, without concomitant experiments, as Dr. Stokvis believes.

### Hearing Aids

*An Experimental Study of Design Objectives.* HALLOWELL DAVIS, project supervisor; S. S. STEVENS, director, psycho-acoustic laboratory; R. H. NICHOLS, jun., associate director, electro-acoustic laboratory. Cambridge, Mass.: Harvard University Press. London: Oxford University Press. 1947. Pp. 197. 11s. 6d.

AS part of an energetic programme of medical reablement the United States Army and Navy commissioned the Electro-Acoustic and Psycho-Acoustic Laboratories of Harvard University to investigate the testing and training of aural casualties and their equipment with hearing-aids. The former laboratory studied the physical properties of existing aids, and the latter their effectiveness when used by patients with different types of deafness. The design objectives of an ideal hearing-aid were evaluated, and a master aid was constructed whereby the maximal degree of hearing could be salvaged from all varieties of impairment. It was found that "most patients hear best with an instrument which amplifies all frequencies uniformly, or with moderate emphasis of the higher frequencies." The natural corollary is that aids need not be fitted like spectacles to suit individual requirements: the aid best suited to any one type of hearing loss is the one best suited to all. The work of both laboratories is recorded in this book, and is of the high standard expected of anything associated with the names of the senior authors. However, most of it is so highly technical that a full appreciation will only be possible to otologists well trained in radio engineering.

*Elements of Surgical Diagnosis* (9th ed. London: Cassell. 1947. Pp. 718. 15s.).—Since the last edition of this book in 1937, its editor, Eric Pearce Gould, has died. This compact work has been a familiar friend to successive generations of students since 1884; and those who turn to the new edition, by Sir Cecil Wakeley, can still be sure of finding a quart measure in a pint pot. Easy reference is assured by intelligent use of bold type and italics in the text; and some of the X-ray illustrations are notably successful.

*The Art is Long* (London: A. Melrose. 1947. Pp. 159. 10s. 6d.).—Introduced by Lord Horder, Dr. William Edwards describes, in language suited to the lay reader, the developments which have taken place in medicine and surgery in recent years, and explains the principles of modern methods of diagnosis and treatment. He stresses the general practitioner's part as the keystone: on his observation and clinical acumen the success of the specialist in any department of medicine largely depends.

*Gifford's Handbook of Ocular Therapeutics* (4th ed. London: H. Kimpton. 1947. Pp. 336. 25s.).—Dr. Sanford Gifford died in 1944, and in revising his book Prof. Derrick Vail, of Chicago, has wished to retain the original flavour. Hence the new edition retains some sections which are not completely up to date; but chapters have been added on penicillin and the sulphonamides, and much else has been modified. Where it deals with treatment by vaccines, sera, antibiotics, sulphonamides, and drugs acting upon the eye there is much to be learned from it, but the section on intra-ocular foreign bodies, retinal detachment, and other conditions in which the treatment is surgical should be revised or omitted. No other volume of its size contains so much information about the therapeutics of the eye.

# THE LANCET

LONDON: SATURDAY, MAY 15, 1948

## Terms of Service

So long as our representatives were pleading the need for major changes in the National Health Service scheme they were unable to consider in detail the regulations and the proposed terms of service. We now find ourselves, within a few weeks of the appointed day, with much unsettled and even more undiscussed, and it was therefore welcome news that, in advance of the special representative meeting to be held on May 28, the council of the British Medical Association had found it possible to accept the Minister's invitation to enter into conversations on the details of the proposed Amending Bill, and on other matters still outstanding. These conversations started on May 7.

It will of course be impossible to survey the whole field afresh at this stage, but many parts of it need special attention. Quite apart from the items to be included in the Amending Bill there are a number of administrative preparations on which early agreement must be reached between the profession and the Minister. The Medical Practices Committee is still not constituted, and its intended preliminary examination of the distribution of doctors is not yet in hand; yet the position of assistants and of aspiring entrants to practice cannot be clear until the policy of this committee is known, and particularly until there is some indication of how many and which areas are likely to be regarded as medically saturated. The obstetricians and the general practitioners have not resolved their difference of opinion whether, inside the public maternity service, midwifery should be concentrated into the hands of those practitioners whose aptitude and experience most certainly entitle them to undertake this work; and the establishment of local obstetric committees, which it was hoped might prove fair and not unfriendly arbiters, has so far been resisted. Clearly, a smooth inauguration of the general-practice and maternity services would not be easy without the guidance of these statutory committees. The local obstetric committee is to be entirely, and the Medical Practices Committee predominantly, composed of medical men and women, and both committees were designed to ensure that the profession itself would solve difficult problems in the establishment and administration of the new service with the minimum of direction from central or local government. Further opposition to their early creation will help neither our credit nor our interest.

By far the largest hiatus in the scheme as so far presented is of course the lack of information about

consultant and specialist practice. It is astonishing that we should find ourselves within eight weeks of the appointed day and still have no knowledge of the terms of service and the method and amount of remuneration which consultants and specialists are to be offered. The profession has every confidence that the findings of the Spens Committee will be just and equitable, but it is by no means so sanguine about the ease with which such findings can be satisfactorily translated into regulations. The first Spens Committee long ago reached conclusions about the proper remuneration of general practitioners, and these were generally agreed to be fair. The Minister accepted them, and they are no doubt the basis of his present proposals for the practitioner's remuneration. Nevertheless (as is argued in our correspondence columns this week) it seems uncertain that the income of the busier and more successful doctor will really approach the level which, under the Spens findings, he might expect to reach.

Many general practitioners feel that the most urgent matters now to be settled with the Minister are those of remuneration—its method and amount. They question, for instance, whether a sum so large, and potentially so variable, as that allocated for mileage, should be taken from the general pool and so possibly cause fluctuations not easily predictable in the size of the capitation remaining to be paid after this deduction. They would sooner see the mileage payment derived from a special ad-hoc fund—as it is at present under National Health Insurance. They are also not sure about the wisdom of allowing an established man the option of taking the basic salary. They can see the wisdom of letting the newcomer to practice receive this extra subsidy during his first difficult years; and they agree that a man who chooses to limit his list, say to 2000 patients, may give a less hurried and perhaps more thorough service to his patients, and so may reasonably claim extra remuneration. But they point out that some men with small lists of N.H.S. patients may have commensurately larger private practices, or other time-consuming commitments, which will negative their chances of giving a better service and also their need for higher remuneration. It is therefore suggested that the permission to be paid in part by a basic salary should be subject to the recommendation of the local executive council according to the circumstances of each case. This would in effect mean that the basic salary would be paid only where it was of proven necessity. Thus it would be in the nature of an inducement payment in difficult areas or at difficult phases of a doctor's professional life; and, if it is thus regarded, should it not preferably be paid out of the intended inducement fund (if this were sufficiently increased) and not left as another variable influencing the problematical size of the standard capitation fee? Finally, the average doctor is very doubtful whether, even if mileage, fixed annual payments, and extra inducements for difficult places were all to come from other sources, the suggested figure of 18s. per head for 95% of the population would genuinely fulfil the promises of the Spens report. He may be wrong in his apprehensions; but we believe that there is at least enough ground for them to justify further scrutiny of the intended terms of service. If the

proposals are seen to fall short of the Spens standard, they should be altered at once rather than later. If necessary, we shall look to the Minister to assume his proper rôle as champion of the health services against the Treasury.

### Epilepsy and the Like

EPILEPTIC fits are common, but their underlying mechanism is still obscure. Their occurrence with focal brain disease or after injury is an obvious starting-point for study, and it was on this type of case that HUGHLINGS JACKSON conceived and elaborated his hypothesis that all epileptic attacks are evidence of cerebral irritation, inhibition, or release. Reviewing the subject anew in his Lumleian lectures last month,<sup>1</sup> Prof. F. J. NATTRASS said that electro-encephalography has fully justified JACKSON'S conception of cortical discharges as the basis of epilepsy. But what sets the discharges in motion? Forty years ago A. E. RUSSELL<sup>2</sup> amassed evidence that all epileptic fits are due to cerebral anæmia caused by cortical vasomotor spasm or by cardiac inhibition. Twenty years later JAMES COLLIER<sup>3</sup> made a more convincing case for the existence of a metabolic dyscrasia. Dr. NATTRASS does not believe that such biochemical changes as have so far been detected are primary or causative; but the alterations in the Berger rhythm shown in the electro-encephalogram (E.E.G.) must presumably be the outcome of physical or chemical changes within brain cells, and the biochemist may yet have the last word.

Local epilepsy, Dr. NATTRASS thinks, still helps to throw light on epilepsy in general, provided the term is allowed to cover discharges arising in any excitable area of the cortex and not in the motor cortex alone. Thus he includes (besides local motor epilepsy) local sensory, visual, and auditory epilepsy, and uncinata fits. All these seizures point clearly to the situation of the lesion, and they also demonstrate many of the phenomena of the major attack. Thus they denote excitation, exhaustion, and inhibition in an area of cortex in a state of functional instability. In grand-mal the same phases succeed each other, though the main phase is one of excitation, and the inhibitory phase is usually represented by sleep. There are, too, inhibitory epileptic attacks in which the patient suddenly loses consciousness and slumps to the ground. Such akinetic or "static" seizures, as they have unfortunately been called (for the term is about as accurate as "static water"), are clinically akin to major epilepsy, but the E.E.G. findings are more in line with those of petit-mal, and so is their response to remedies. Petit-mal is an example of almost pure inhibition, though the eyelids may flicker and the head sometimes jerks. It is perhaps not generally known that about two-thirds of the children with petit-mal later develop grand-mal; but those who do not do so may grow out of the minor seizures after a few years, without impairment of intelligence even after thousands of attacks. The electrical changes in the cortex during and between petit-mal seizures are, it seems, the most constant and characteristic of all types of epileptic

discharge, arising synchronously and symmetrically over a wide area of cortex but chiefly over the frontal lobes. Psychomotor attacks, which may follow a major fit or occur independently, take the form of champing movements of the jaws, grimacing or muttering, writhing movements of the trunk, or bouts of elaborate and purposeless activity. In these, the E.E.G. record shows an extreme slowing of cortical activity. Another manifestation seen between major attacks is myoclonic jerking, known to patients as "the jumps." This condition is also accompanied by cortical electrical changes; and these may be seen when no jerking is taking place. Though usually bilateral, the jerks are not associated with loss of consciousness, which seems to rule them out as a form of local cortical epilepsy. There is some evidence that they originate at a level lower than the cortex.

So much for epileptic manifestations. With them have been included from time to time a range of paroxysmal disorders including fainting, vasovagal attacks, vertigo, migraine, and some sleep disturbances, such as narcolepsy. LENNOX<sup>4</sup> has even suggested that a disturbance which is essentially "epileptic"—that is, involving abnormal rhythmic activity—may start anywhere in the nervous system, the site in clinical epilepsy being the cortex. This conception brings in chorea, parkinsonism, and neuralgia, and introduces a danger (Dr. NATTRASS remarked) of theory outrunning experience. To say there are many types of discharging lesion is not—or should not be—to say that all these lesions are epileptic. Differentiation, he holds, should rest on clinical findings; for a diagnosis of epilepsy carries, for the clinician, the possibility of serious intracranial disease or of mental deterioration, and with definite social consequences—considerations which do not arise with other paroxysmal disorders. Thus syncope or fainting, in the sense of a reflex vasovagal attack, is not epilepsy, though the distinction from akinetic epileptic attacks may be hard to make. A faint is an emotional reaction, while a fit is rarely due to a direct emotional stimulus: air-raids, TYLOR FOX<sup>5</sup> reports, made no difference to the attack-rate in patients at Lingfield.

The term "vasovagal attack" was applied by Sir WILLIAM GOWERS not to syncope but to a condition characterised by pallor, coldness, and immobility, followed by shaking, difficulty in breathing, pain of anginal distribution, and *angor animi*; but Dr. NATTRASS classes such attacks as other than epilepsy, since they are clinically distinct and have different prognosis and treatment (F. M. R. WALSH<sup>6</sup> has noted, moreover, that the patients show no consistent vasomotor change or vagal inhibition; so the term vasovagal attack, if used at all, should rightly be reserved for fainting). On similar grounds Dr. NATTRASS rejects as epileptic such conditions as so-called laryngeal epilepsy, breath-holding attacks in young children, narcolepsy, cataplexy, catalepsy, "night-nurse's paralysis," "sleep paralysis," and paroxysmal vertigo. Migraine, however, provides him with a puzzle. The cortical phenomena of migraine—the scotomata, hemianopia, and fortification images; the sensory disturbances in the tongue, lips, arm, and

1. Two Lumleian lectures entitled Clinical and Social Problems of Epilepsy, delivered before the Royal College of Physicians on April 13 and 15.

2. *Proc. R. Soc. Med.* (sect. med.), 1907, 1, 72.

3. *Lancet*, 1928, 1, 587, 642, 687.

4. Lennox, W. G. *J. Amer. med. Ass.* 1945, 129, 1069.

5. Fox, J. T. *Lancet*, 1941, 1, 631.

6. Price's Textbook of Medicine, 6th ed., p. 1687.



sometimes leg; the rare hemiplegia—are now attributed to constriction of cerebral arteries, and the subsequent headache to arterial dilatation and excessive pulsation—vascular changes which have no counterpart in epilepsy. Despite the clear genetic relation between the two disorders he feels that the association between them can be overstressed.

Accepted medical ideas about epilepsy have been largely built up on data obtained from what were in fact selected groups of patients. The two obvious groups, institutional and non-institutional, are far from being the only ones; the epileptics who reach the neurosurgeon's consulting-room, for instance, would make up a picture very different from that of epileptics in general. As Dr. NATTRASS pointed out, most epileptics of adult age are earning their own living and taking their full place in the community, and he urged that they should be treated from childhood onwards as far as possible like their fellows, and that every effort should be made to curtail limitations, even if some risks are involved. He would not hesitate to encourage suitable patients to take up professional careers, and would rarely discourage marriage or even parenthood. As he said, the development of a fuller life for epileptics generally will depend primarily on the initiative and coöperation of their doctors.

### An International Success

THE very length of the title of the Conference for the Sixth Decennial Revision of the International Statistical Classification of Diseases, Injuries, and Causes of Death, held in Paris at the end of April, indicates the vast effort that has gone into its preparation. The draft proposals for a new international system of recording disease realise a long-felt aspiration of medical statisticians. As so often, WILLIAM FARR has had, if not the first, then the decisive word. "Statistics," he said, "is eminently a science of classification . . . and any classification that brings together in groups diseases that have considerable affinity, or that are liable to be confounded with each other, is likely to facilitate the deduction of general principles." Up to now the international classifications have been intended only for the causes of death, but as FARR recommended, it is desirable "to extend the same system of nomenclature to diseases which, though not fatal, cause disability in the population."

The expansion of health insurance and other plans for medical care, and the present resurgence of interest in scientific studies of the incidence of disabling disease in industrial populations, combine to give point and urgency to the need for internationally agreed standards of disease classification. But this taxonomic problem has agitated the minds of vital statisticians at least since the 18th century, when SAUVAGES made the first attempt at the systematic classification of disease. When FARR took up his post at the General Register Office in 1837 he found that the classification in most general use was one by WILLIAM CULLEN, of Edinburgh, published in 1785 under the title *Synopsis Nosologiae Methodicae*. His dissatisfaction with this method led him to evolve a new classification. The general arrangement included the principle of classifying diseases by anatomical site, which has survived as the basis of the present *International List of Causes of Death*. This work was carried

on by BERTILLON, who was the guiding force behind the 1900, 1910, and 1920 revisions of the list. The need to classify the voluminous records of patients in both Service and civilian hospitals during the war led to the development on both sides of the Atlantic of groupings of diseases causing sickness as well as death. Over here, for example, Dr. PERCY STOCKS and Dr. A. H. T. ROBB-SMITH produced for the Medical Research Council a provisional classification based on the *International List of Causes of Death*. Meanwhile in America a committee under the chairmanship of Dr. LOWELL REED worked for a compromise between this initial attempt and the various methods in vogue in the United States in 1945. Their proposals were put to the test of practice in various hospitals and government departments, and the results of this experience have been embodied in a final revised draft which formed the basis for discussion in the recent conference.

In these proposals the broad framework of the international list has survived; the main classification has categories for diseases caused by well-defined infective agents, and for neoplastic, allergic, endocrine, metabolic, and nutritional disorders. The remaining diseases are classified according to their principal anatomical site, but there are special sections for mental disorders, complications of pregnancy and childbirth, and certain diseases of infancy and old age. The special problem of injuries has been dealt with by dividing them either by their external cause or by their anatomical result. In general, the administrative needs of punched-card methods of handling such data are to be served by a three-figure code number for each disease. The first two figures define the broad group to which the particular illness belongs; the third figure indicates the appropriate subdivision of that major group. Thus pernicious anaemia would be coded 290, the "29" indicating that the disease was one of the blood or blood-forming organs, while the "0" differentiates it from, for example, haemophilia, to which the code figure "5" has been allocated. This numbering system results in flexibility and utility, since the first two figures indicate broad groups, while within these broad groups the use of the third digit allows new categories to be introduced without upsetting the basic numbering. Where finer divisions are required a fourth digit can of course be used. The advantages of such a system to hospital or government statisticians are clear, and it is gratifying that the Paris conference, which was opened by Monsieur BIDAULT, the French foreign minister, and presided over by the distinguished permanent secretary of the Academy of Medicine, Professor BAUDOIN, reached complete agreement on the draft proposals. This ensures that the statistics of both mortality and morbidity produced in all the countries bound by this agreement will be comparable, and draft regulations will be submitted, with the new list, to the World Health Assembly meeting at Geneva in June.

By combining hard preparatory work with a disposition towards reasonable compromise in negotiation, the United Kingdom delegation, led by Mr. GEORGE NORTH, LL.D., the Registrar-General, played a notable part in securing the success of this important conference.

## Annotations

### HEADQUARTERS OF WORLD HEALTH ORGANISATION

THE decision of the Interim Commission of WHO to hold the first World Health Assembly in Geneva, rejecting the British Government's offer of London,<sup>1</sup> raises the question whether Great Britain may yet be the permanent seat of the organisation. The Interim Commission, during its two years' existence, has had its headquarters office in New York though the bulk of the work is handled from Geneva, and the disadvantages and expense of this duality have become obvious to all. The commission is required to submit to the assembly a report on "studies regarding the location of headquarters of the organisation," and in January it adopted a report which, after examining the claims of New York, Paris, London (or some other place in England), and Geneva comes down strongly in favour of the last named, though no definite recommendation is made. Among the factors considered were the administrative advantages of having the WHO headquarters in close association with the United Nations and other international agencies; the possible political influences on a technical organisation situated in the capital of a large country; the question of facilities, privileges, and immunities offered by the host government; the advantages of having United Nations specialised agencies in as many countries as possible; the cost of living; ease of communications; accessibility of active medical centres; and accommodation, climate, recruitment of subordinate staff, and educational facilities. In reply to an inquiry from the executive secretary of the commission, a majority of signatory governments have expressed a preference for Geneva, with New York as a bad second. But replies have come from only a small proportion of the governments that will be represented at the World Health Assembly, and are in no way binding.

The chief assets of Geneva are its situation in a small, "neutral" country; its amenities; and, above all, the clear-cut and advantageous offers of the Swiss government to provide both temporary and permanent accommodation. (The obvious accommodation, the Palais des Nations in which the commission now works, will be entirely occupied by the United Nations and therefore not available to WHO.) Its disadvantages are a cost of living which is higher than in the rest of Switzerland, and even above that of New York; a foggy winter climate; and especially a certain air of unreality which comes of discussing world affairs at an artificial rather than a real world centre, with a faint aura of past failure. A conference at Geneva is inevitably regarded as "just another conference," and this feeling is increased by the provincial atmosphere, which has been neatly described as that of *une sous-préfecture internationale*.

New York, Paris, and London, on the other hand, are real world centres. New York has many advantages when one considers public opinion in the Western Hemisphere, ease of liaison with U.N. and other interested bodies, and its central position between Europe and the East. But the delay of the U.S.A. and South American countries in ratifying the constitution of WHO—it is probable that the U.S.A. will only be represented by observers at the World Health Assembly—makes it almost certain that the headquarters will be in Europe. Paris has never been a very serious candidate, and already has UNESCO; but London—or rather Great Britain, because the British Government has been careful not to limit its offer to London—has much in its favour. No international organisation has its seat in the United Kingdom; and, if they are not to be concentrated at or near the United Nations, there is much to be said for

one at least being placed there, particularly in view of the great traditions of this country in public health. Since the cost of living in London is relatively low, the expenses of WHO would be reduced. One might add that it seems reasonable that Great Britain should receive some return in hard currencies for her relatively large contribution to international health organisation, both now and in the past. Unfortunately there seems to be a general impression that if the headquarters of WHO were in London delegates to its conferences would lose in physical circumference what they gained in mental stature; and another general opinion, derived from Dickens, is that London is wrapped all winter in a thick yellow impenetrable fog. But the chief hindrance so far has been the lateness and vagueness of the invitation, and it will need a much more definite offer, pressed with greater energy, if Great Britain is to get the opportunity it deserves of having the headquarters of the World Health Organisation in this country.

### INJURY IN THE HOME

A GROUP of postgraduate students, working at the London School of Hygiene for the diploma in public health, have been making a survey of accidents in the home. In this they found not only plenty to learn but something to teach; and last week they delivered their message in a play written and produced by one of their number.

Graced with an ingenious and witty script, this production begins by showing some of the difficulties that any surveyor must learn to overcome: the person to be interviewed is apt to be out whenever a call is made and does not reply to letters; perhaps the surveyor (by accident or on purpose) has been given the wrong address; and occasionally, even when run to earth, the subject staunchly opposes intervention by "snoopers." Having surmounted these obstacles the surveyors found that the cases under review could be classified as follows (fatal accidents in 1945 are given for comparison):

	Survey (all non-fatal)	Deaths in England and Wales 1945
Falls—		
on stairs	61	711
others..	120	2814
Burns—		
clothing	—	395
others	48	347
Scalds ..	31	202
Suffocation	—	327
Cutting and piercing injuries ..	112	12
Swallowed foreign bodies ..	35	32

Unhappily, the survey provides no accurate guide to the relative frequency of various forms of accident; for example, a swallowed fish-bone may cause only passing embarrassment, taking the patient neither to his own doctor nor to hospital. As to predisposing factors, this study suggests that two-thirds of the accidents are due to carelessness of one sort or another. Those who are irritable or tired or ill or unhappy or "just plain dumb" are more likely than others to find themselves in trouble. But this is only one aspect: overcrowding, poor lighting, old or bad equipment, and other environmental causes may be brought to light; and sometimes, with a whole complex of interweaving factors, it is impossible to apportion the blame.

The implication is that people ought to be shown how best they may avoid disaster under their own roof. How should this instruction be conveyed? A film on burns which was shown in the course of the play conveyed with terrifying intensity the risks to young children of the open fire, the cauldron of boiling water, and the gas-ring. One performer observed that if, as a layman, he saw this film at his local cinema, he would rush home forthwith to make sure that the

1. *Lancet*, May 1, pp. 684, 692.

fire was out and the gas turned off, and he would then turn his children out on to the street. But if, a week later, he were to see *Death on the Roads*, he would shoo his young family back into the house.

### BLOOD CHANGES IN PREGNANCY

INVESTIGATION of the physiology of pregnancy is still in its infancy, and has consisted chiefly in measuring the difference in various respects between pregnant and non-pregnant women. This approach is exemplified by a study of the composition of the blood of women in pregnancy and the puerperium by Hoch and Marrack<sup>1</sup>: it makes dull reading but it is a careful record and contains a quantitative critique of the methods used, which means that the data can be used for future reference, even if their present meaning is obscure. Certain changes are obviously due to dilution of blood, though the concentration of hæmoglobin suffers more than that of serum albumin and that of serum globulin is maintained. This makes the word "dilution" somewhat inappropriate. Albers<sup>2</sup> found the albumin concentration further diminished in severe œdema, but the globulin concentration actually increased. In an excellent report by McLennan and Thouin<sup>3</sup> an increase in blood volume has been confirmed by an improved technique, and its extreme variability is demonstrated. This variability makes the use of average figures dangerous, but it appears that at term the average plasma volume is increased by about 40%, the red-cell volume by about 20%, and the total blood volume by 32%. No figures for hæmoglobin are given, but though Albers,<sup>2</sup> Mull and Bill,<sup>4</sup> and others have shown that the total hæmoglobin in the blood is normally increased (despite the fall in its final concentration) these figures suggest that the volume of each red cell may be increased. Adair, Diekmann, and Grant<sup>5</sup> concluded that even after making allowance for dilution of the hæmoglobin, 11.5% of their patients were anæmic, but there is evidence (Whipple and Robschett-Robbins<sup>6</sup>) that though the requirement for iron goes up in pregnancy, anæmia may sometimes be due to deficiency of utilisation rather than to lack of iron in the diet. The investigators point out that their average findings could not justifiably be applied to an individual; but there was no exception to the rule that the blood volume rapidly decreased after delivery, and this also agrees with previous observations. Albers points out that the decrease is chiefly due to loss of fluid (for which he has an ingenious explanation) and that postpartum hæmorrhage involves a relatively much greater loss of erythrocytes than prepartum hæmorrhage. The changes in blood volume must in some degree reflect changes in the quantity of extracellular fluid, but, possibly again owing to the employment of average figures, Chesley's<sup>7</sup> measurements of extracellular fluid suggested an unequal distribution of fluid between blood and other tissues.

Two points were made in a discussion of McLennan's report. Willard Allen suggested that the abrupt change after parturition coincides with the loss of an enormous store of hormones in the shape of the placenta. It has been shown in animals, including the monkey, that the placenta, after removal of the foetuses, determines a maternal syndrome indistinguishable from pregnancy; also that the retention by a healthy pregnant woman of dietary constituents beyond her own needs starts

long before the foetus is able to use them, and indeed that while in utero the foetus never wholly uses them. The only likely way in which such a maternal syndrome could be determined is by an endocrine adjustment, and the placenta must play a leading part. Secondly, Gordon Douglas pointed out the desirability (and the difficulty) of following individual patients throughout pregnancy instead of relying on statistical observation of large numbers.

### THE E.B.S. INFORMATION BUREAU

LONDON doctors are making good use of the Emergency Bed Service provided by King Edward's Hospital Fund; but they have still to take full advantage of the information bureau which the service now offers. This was launched two months ago<sup>1</sup> and so far 45 questions have been answered. Their pleasing diversity reveals the common and uncommon problems likely to puzzle doctors; and the results show how helpful the E.B.S. team of telephonists can be to the busy doctor. Here are two examples:

At 4.15 P.M. the bureau received a request for anti-ædema serum for a boy in a critical condition through a snake-bite. By 4.40 inquiries at four large drug firms and the Hospital for Tropical Diseases had drawn blank; at 4.50 three phials of serum were located at the Zoo, and the authorities—who have quite a number of calls for it—expressed their willingness to part with some if absolutely necessary. At 4.55 P.M. one of the drug firms offered antisera for four different kinds of venomous snake; and by 5.5 P.M. all the information had been telephoned to the doctor.

On another occasion the bureau was asked how to find accommodation near home for a baby aged 7 months whose mother was being admitted to a mental home, and was able to suggest the "Proxy Parents," and to give the telephone number.

Many inquiries relating to blood-transfusion services can be answered on the spot, and some requests put the bureau on the track of slightly out-of-the-way information which can be entered in the card-index against future inquiries. Thus the team could now supply immediately the names of hospitals in the London area which undertake electro-encephalography (information collected in 45 minutes), and could say off-hand where a sample of urine should be sent for a pregnancy test, and which London hospitals have rheumatism clinics. Information about ambulance services and private nursing coöperations is easily given. Some subjects have proved more thorny. Thus the file containing the requests of doctors for beds for elderly and chronic patients makes dismal reading: again and again the E.B.S. had to ring back with the news that all available homes had waiting-lists. But this is the result of our present dilemma, not the fault of the bureau. Sometimes the required information is unobtainable—doctors asking the names of nursing-homes for this or that purpose in a given area are liable to be disappointed, because there is no register of nursing-homes to which the bureau can turn. A list of the homes which specialise in the treatment of alcoholic addiction would prove very useful, and might form a suitable appendix to the *Directory of Convalescent Homes* published by the King's Fund. Perhaps, too, the bureau might mention the work of Alcoholics Anonymous to doctors inquiring about such patients.

The bureau has been able to solve in a matter of minutes most of the problems submitted; and the team could deal with many more. The service has been used already by doctors, nurses, almoners, and others, but it does not undertake to supply information direct to patients, nor does it wish to deal with questions which should obviously be addressed direct to hospitals, regional boards, local authorities, or commercial firms. Its

1. Hoch, H., Marrack, J. R. *J. Obstet. Gynec.* 1948, 55, 1.
2. Albers, H. Normale und pathologische Physiologie im Wasserhaushalt der Schwangeren. *Zwangslose Abhandlungen auf dem Gebiete der Frauenheilkunde*, Leipzig, 1939; vol. 1.
3. McLennan, C. E., Thouin, L. G. *Amer. J. Obstet. Gynec.* 1948, 55, 189.
4. Mull, J. W., Bill, A. H. *J. Lab. clin. Med.* 1945, 30, 458.
5. Adair, F. L., Diekmann, W. J., Grant, K. *Amer. J. Obstet. Gynec.* 1936, 32, 560.
6. Whipple, G. H., Robschett-Robbins, F. S. *J. exp. Med.* 1942, 76, 283.
7. Chesley, L. C. *Surg. Gynec. Obstet.* 1943, 76, 589.

1. See *Lancet*, March 6, p. 385.

potentialities are great, and with every piece of information added to the filing system the chances are better that a given question can be answered on the spot. Doctors in suitable quandaries are advised to ring Monarch 8515 and go back to the bedside (or even to bed, for this is a 24-hour service), leaving their dilemmas with the E.B.S.

#### FETAL DEATH OR DEFECT FROM MATERNAL INFECTIONS

It is now clear that German measles in the mother during the first four months of pregnancy often produces congenital defects such as cataract, heart disease, deaf mutism, and dental and mental abnormalities in the child. That this association was not confined to the particularly widespread epidemic in Australia in 1939 has been shown by the many similar observations made here and in the United States. The most extensive defects have been noted when the maternal infection was contracted in the first six weeks of pregnancy, and Aycock and Ingalls<sup>1</sup> suggested that the type of abnormality is directly related to the stage in pregnancy at which infection occurred; thus a cataract is likely to follow infection at six weeks, deafness at nine weeks, and a cardiac abnormality at five to ten weeks. Such precision is perhaps premature, but the observation that the chance of congenital defects is much higher when infection takes place in the earlier rather than later months is highly suggestive of a specific effect of the virus on the developing embryo.

The method of approaching this problem by interrogating the mothers of known defective children gives no indication of the probability that an infection will be followed by congenital defect. Yet until this probability is known no balanced judgment can be made on, for example, the advisability of therapeutic abortion. If it was established that congenital defect inevitably follows all cases of rubella in early pregnancy, then abortion might be a logical course. If, on the other hand, the risk, though definite, is not much greater than the normal 1 in 100 chance of congenital defect, then such drastic measures would be out of place. Several attempts to answer this pressing question have been made in the United States, notably by Fox and Bortin<sup>2</sup> in Milwaukee and Ober et al.<sup>3</sup> in Massachusetts, who interrogated the married women notified as having German measles in a selected period. Ober and colleagues found that 4 out of 5 infants were lost by abortion or stillbirth or were born defective when their mothers had rubella in the first month of pregnancy, 4 out of 8 in the second month, and 3 out of 9 in the third month, but that the rate of loss or defect fell to 4 out of 27 where infection took place in the last five months of pregnancy. This supports the view that there is a very serious risk to the fetus when rubella is contracted in the first three months.

There are three possible effects on the fetus of rubella infection in the mother—(1) no effect, (2) congenital defect, and (3) death by abortion or stillbirth. The findings discussed by Swan in this issue, and those of Ober et al., suggest that the risk of foetal death at or before term, like the risk of congenital defects, is highest when rubella is contracted in the first four months of pregnancy. Fox and colleagues report on page 746 an inquiry into the incidence of anomalies following maternal measles, mumps, and chickenpox in pregnancy; but these childish infections are too rare in adults for convincing results to emerge. In a town of half a million inhabitants, over a four-year period, there were only 6 cases of measles, 23 of mumps, and 4 of chickenpox in pregnant women; and only in 1 case of measles did a congenital defect arise.

It is not going to be easy to decide the exact probability of infant defect or death following each of the commoner infectious diseases at each stage in pregnancy. Precise knowledge of the "exposure to risk"—i.e., the total number of women who have contracted infections in pregnancy—can only be obtained by the co-operation of local health authorities so that the net can be spread widely and efficiently. Swan pleads for an extensive long-term inquiry, based on the compulsory notification of all infectious diseases occurring in pregnant women. This should be combined with the close interrogation of all women presenting themselves at antenatal clinics. The following up of all pregnancies complicated by infections, both by clinical examination of the children born alive and by necropsy studies of those born dead, is a first essential of useful work in this field.

#### NEW VENTURES WITHIN THE COMMONWEALTH

To promote interchange of medical, surgical, and scientific ideas within the British Commonwealth, Mr. Arthur Sims, of Christchurch, New Zealand, two years ago endowed a travelling professorship. Anyone who reads Sir Hugh Cairns's report<sup>1</sup> on his three months in Australasia as the first Sims Commonwealth professor will see that this innovation is most valuable. The travelling clinician is not a new phenomenon, and we all owe much to the enterprising way in which leaders of the profession have taught and learnt abroad. But it has rarely, if ever, been possible for teachers and practitioners at the height of their powers to undertake a tour lasting three or four months with every possible advantage from official status and previous planning. Cairns had the further advantage of being as much at home in Australia as in Oxford, and this no doubt helped him to fulfil the onerous programme of orations, lectures, conferences, discussions, demonstrations, consultations, conversations, and visits which are briefly recorded in his diary. The lectures were all based on work done by the Oxford team, and though the visiting professor watched the neurosurgical work at Auckland, Dunedin, Melbourne, Adelaide, and Sydney he did not himself operate. Clinical demonstrations by the staff of the hospital visited were found to be especially convenient occasions for exchanging experience and ideas. But in addition his opinion was sought by many official bodies, on such subjects as the methods of clinical teaching, postgraduate education, and diplomas, and the establishment of chairs and new medical schools, and by individuals on the prospect of work overseas. On financial and administrative questions he had talks with the prime minister and minister of health of the Commonwealth, the deputy premier and minister of education of South Australia, and the minister of health of New Zealand; and he recorded broadcasts on medical topics. His report contains useful information about the dissatisfaction arising from the number of higher surgical examinations that have to be taken, and mentions a feeling that "when the young surgeons come to Britain they should spend their time working with a British surgeon or in research rather than in attending classes for the primary and final F.R.C.S." Even more important, however, are his suggestions for British work in Australia and New Zealand where "there are departments which are in the first flight in their own fields." The time, he thinks, is ripe for the establishment of postgraduate medical fellowships for British graduates:

"Ultimately it is to be hoped that there will be free trade of medical teachers and research workers between

1. Aycock, W. L., Ingalls, T. H. *Amer. J. med. Sci.* 1946, 212, 366.  
2. Fox, M. J., Bortin, M. M. *J. Amer. med. Ass.* 1946, 130, 568.  
3. Ober, R. E., Norton, R. J. M., Feemster, R. F. *Amer. J. publ. Hlth*, 1947, 37, 1328.

1. Australasian Tour of Sir Hugh Cairns, Sims Commonwealth professor, January to April, 1948. Report to the presidents of the Royal College of Physicians, Royal College of Surgeons, Royal Australasian College of Physicians, and Royal Australasian College of Surgeons.

all parts of the British Commonwealth, but it is not likely that this will happen without the stimulus and example provided by a small number of endowed fellowships. These fellowships should be for training in research and technical methods, over a period of two years. It would be advisable that the fellows should hold permanent appointments in Britain from which they could be seconded. Quite apart from its intrinsic merits a new venture on these lines would have an important effect on Australasian medicine which has so long looked for leadership from overseas that it has not always realised how good its own original work in some fields has become."

### HEALTH CENTRES FOR LONDON

THE London County Council's health committee has been revising its health-centre programme in the light of the Minister of Health's celebrated circular 3/48, and on Tuesday the council considered fresh proposals. These call for the construction, at Stoke Newington, of a new comprehensive health centre, and for the adaptation of existing buildings to form one comprehensive centre in each of the nine health areas into which London has been divided for the administration of personal health services. A university health centre is to be formed in association with the appropriate departments of London University.

The Stoke Newington centre, theoretically serving some 18,000 people, is planned to contain suites for six doctors and two dentists; besides general medical and dental services, there will be antenatal, postnatal, and child-welfare clinics, a school treatment centre, space for health education, a foot clinic, and other accommodation, including a side-room. The buildings for adaptation have still to be found. Some of the metropolitan boroughs, under the terms of the Public Health (London) Act, 1936, have hitherto maintained clinics providing dental treatment for expectant and nursing mothers, children, and the population generally. Clinics of this nature will probably be transferred to the L.C.C. as part of the maternity and child-welfare services; but as a local health authority the council will not have power to provide general dental services, and this power, in the fullest co-operation with the executive council, it is now to seek. Recognising the need for suitable sites, the L.C.C. proposes to acquire land for the later development of health centres; and meanwhile it suggests that large houses (including perhaps some doctors' houses) should be taken over for use by three or four doctors, and possibly dentists as well, as centres for group practice. This would help to meet the common desire among doctors and dentists for relief from the necessity of making individual provision for secretarial and nursing staff, and for the acceptance of telephone calls. It is proposed that doctors and dentists working from a health centre shall form a professional committee, to include the divisional medical officer; any recommendations will be passed to the divisional health committee.

Last year the council announced<sup>1</sup> its plan to subdivide the nine main divisions into 165 health-service areas, each composed of two or more neighbourhood units and containing about 20,000 people; all would have a comprehensive health centre, and no-one would have to travel much more than a mile to reach the nearest centre. The present proposals, even if carried through in full, are no more than a beginning. But by this start doctor and patient will gain experience in the light of which the full plan can be formulated. Boldly, it may be thought, no geographical barrier is to be imposed on the use of centres; they will be open to all. Perhaps not every north Londoner will come for medical advice to Stoke Newington; but many of the 100,000 who live within 1½ miles of the proposed centre may decide to do so.

1. See *Lancet*, 1947, II, 918.

### THE CHILDREN BILL

THE debate on second reading of the Children Bill in the House of Commons on May 7 showed how widely its provisions are approved. But Lady Allen of Hurwood was still able to make her main criticism of the Bill in the *Times* of the same day. "For some inscrutable reason," she wrote, "the treatment, safeguards, and opportunities thought desirable for local authority children are not, in the Bill, so clearly defined for children who will fall under the care of a voluntary organisation, even though the homes will be partly covered by registration and inspection." She pointed out that the Bill does not say which children will be the responsibility of the voluntary organisations, and this may lead, she thinks, to competition for the deprived child, or worse to an evasion of responsibility. She holds that every child who has no effective parent or guardian should pass through a local-authority county or regional centre before being placed with a voluntary organisation. That such centres could have a further important function—that of saving family life—is evident from the experience of the Caldecott Community,<sup>1</sup> which has set up an experimental centre, sponsored by the Nuffield Foundation, and working in conjunction with the Kent local authorities. Here the needs of homeless children are carefully assessed before they are placed; but in addition the cases of children brought to the centre because of neglect by their parents have also been closely studied. In spite of the neglect—which commonly springs from the ignorance, ill health, or poverty of the parents—love and loyalty in such families are often deep; and in several cases the observation centre has advised the local authority to re-establish family life.

Lady Allen's concern does not seem to have been widely shared in the Commons debate. Mr. Somerville Hastings hinted that the supervision of voluntary bodies exercised by the officers of the Secretary of State might not go far enough. He noted that the children's officer will be able to visit such homes, and will have power to advise on local-authority children boarded there, but will she (he asked) be able to make suggestions for improvement of conditions?

Lady Allen feels there is a good case for making the State fully responsible for all deprived children, and for abolishing altogether the practice of making any child dependent on charity. The counter argument to this, raised in the debate, is that voluntary bodies are more flexible than statutory bodies, and can make pioneer experiments. It must not be forgotten, however, that tradition can be as hampering as red-tape. A free and forward-looking voluntary body is an engine to clear the way for advancing thought; but a voluntary body which is content with its past achievements and does not seek to better them can become a dangerous anachronism. It is the second type which Lady Allen so much distrusts.

### RELIEF WORK FOR CHILDREN

THE United Nations' International Children's Emergency Fund has arranged a training course in paediatrics for those who will administer the fund. Numbering 100, they include doctors, heads of nursing schools, social workers, teachers, and architects. The course, which started in Paris on April 5, will last about four months and will include a week's visit in June to Britain, where lectures and visits are being arranged by the Ministry of Health with the help of Prof. Alan Moncrieff.

AN Interdepartmental Committee on Overseas Scientific Relations has been set up to advise on Government policy. The chairman is Sir Edward Appleton, F.R.S., and the secretary Mr. H. L. Verry, Department of Scientific and Industrial Research, 142, Piccadilly, London, W.1.

1. See *Times*, May 10.

## Special Articles

### HUMAN FACTORS IN INDUSTRY

BRITISH ASSOCIATION CONFERENCE

THE British Association's division for social and international relations of science met at Leamington last Saturday, under the chairmanship of Sir HENRY TIZARD, F.R.S., and Sir GEORGE SCHUSTER, to discuss human factors in industry.

#### Working Conditions

Opening the first session, which was devoted to working conditions, Prof. R. E. LANE (Manchester) suggested that the industrial medical service must be integrated with the National Health Service. The war, he said, had brought great expansion in the industrial medical service; by the end of it some 200 whole-time and 800 part-time medical officers were engaged in this field. Nor was there any sign that the service was now contracting.

Environment in industry was the concern of a team including physiologists, physicists, chemists, engineers, foremen, and managers. The doctor's duty was foremost that of education; a vast amount of information was being ignored, and in particular some municipal undertakings were not making use of existing knowledge. Furthermore, research bodies had not sufficiently interpreted results to managers; research-workers must emerge from their ivory tower. These further tasks fell to the doctor:

1. *To see that the worker is fit for his job.*—Allocation of workers had its counterpart in job-analysis. Under the Disabled Persons Act a number of not-quite-fit were employed; and the labour force was ageing. Industry should take a lesson from the Services and give the doctor and the physiologist a voice in the design of plant.

2. *Resettlement.*—One of the most important parts of medical treatment was work; this must be dispensed by the doctor and provided by industry.

3. *Casualty service.*—At Birmingham there had been considerable research into the treatment of minor injuries. The lessons of this must be carried into industry by nurses; but as there were not enough nurses they must be diluted with first-aiders, who ought to be trained along modern lines.

4. *Ancillary services.*—Among these were foot and ophthalmic services; ageing workers often did not realise that their increasing slowness and impaired efficiency were really due to failing vision.

5. *Seeing that the job is fit for the worker.*—Where there was a particular industrial hazard an important part of the doctor's task was to allay fears.

Professor Lane concluded: "Production comes from people, and they need as much care as the machines they attend."

#### COAL-MINING

Dr. C. L. COPE, director of research into human problems, National Coal Board, pointed out that coal-mining is unique in the artificiality of the environment. Miners had air supplied artificially, and they were exposed to noxious dusts and the risk of explosions; the walls of their workplace were black, so the reflection of light was poor; they had to operate heavy machinery or work themselves, in cramped conditions; and many had first to walk  $1\frac{1}{2}$ –2 miles underground, which might take 20% of the energy used in the working day. Moreover, the miner who wished to move elsewhere was handicapped by the Essential Works Order.

Each year there were 500 deaths in the mines; and accidents accounting for more than three days' loss of work numbered 180,000—1 to every 4 miners. Every year 4000 were certified as having pneumoconiosis;

1800 were put off work with nystagmus, and 1500–1600 with dermatitis. These and other disabilities caused miners to leave their work between the ages of 35 and 50, at the very time when they were most useful and when it was most difficult for them to adapt themselves to another job. Moreover, the peculiar wages system developed in the past hundred years was a source of repeated disputes and friction. Absenteeism was therefore not surprising. Nevertheless, the spirit of most miners was excellent. They were independent and they were not fully conditioned to the routine of town life, with its fixed hours of work.

One of the foremost considerations was light. The cap lamp was a good means of lighting the surface; and whereas in 1928 only 1% of miners had a cap lamp, in 1947 43% had one. Among other methods the most promising was fluorescent lighting, which was being tried out throughout the country; there were, however, difficulties of cost, maintenance, and supplies. Better lighting would lower the incidence not only of nystagmus but also of the preceding impairment of ability to see in the dark and of stereoscopic vision; and it might be expected to reduce the number of accidents.

#### LIGHTING, HEATING, AND VENTILATION

Mr. H. C. WESTON, of the Industrial Health Research Board, said that proper lighting was necessary (1) for cheerfulness and invigoration, and (2) to show the details of the work; the two conditions were not necessarily satisfied together. Experiment had shown a direct relationship between productivity and illumination. With the changing age-distribution of workers it was especially important to bear in mind that older people were particularly affected by bad light.

Mr. T. BEDFORD, D.Sc., of the Industrial Health Research Board, said that for each worker 600–1000 c. ft. of air per hour was desirable; and 6 air changes per hour was probably sufficient to keep the bacterial content tolerably low. In summer the temperature for light workers might range from 60° to 68°F; for heavier work the range should be from 55° to 60°F. Where humidity was excessive vigorous air movement was necessary. To avoid draughts or stuffiness the air speed should normally be 20–40 ft. per min. Thus the requirements were that the air should be as cool as was compatible with comfort, that air movement should be sufficient but should not cause draughts, and that the relative humidity should not exceed 70%. Heating and ventilation appliances should be properly supervised; a stoker who had the factory cold in the morning often sought to make good his neglect with stupefying heat in the afternoon. Air heaters, if used, should handle large quantities of air, bringing it to only the required eventual temperature; and any subsequent loss in temperature should be made good by other means.

#### Human Relations

As chairman at the second session, Sir GEORGE SCHUSTER said that the human individual must be considered as an end in itself. The great problem was to see that the environment in industry was not out of harmony with everything the worker sought as an individual. If this were accepted as the governing consideration, increased production would follow.

Dr. R. F. TREGOLD, of Roffey Park Rehabilitation Centre, held that the need for social skill was too little appreciated. The possibility of training leaders, and especially senior leaders, had still not been fully understood. In the investigation of human relations there was need to explain what was done and why. There was resistance to discussion of how the mind worked. By some it was felt that such discussion was a matter for experts, or that it was "not quite nice." Others feared to face up to this study, perhaps through unwillingness

to admit that they were not absolutely perfect. It was certainly difficult to look at the subject dispassionately.

There was an essential link between the mental, physical, and social life; in prevention and rehabilitation account must be taken of all three. Rehabilitation centres and hospitals should have the means of increasing the patient's social interests and responsibilities. Nowadays the tendency was to avoid social responsibility; there was too much spoon-feeding.

#### INCENTIVES

Mr. D. CHAPMAN, of the School of Social Sciences and Administration, Liverpool University, said that the word "incentive" had become discredited because most schemes of incentives had had the effect either of increasing piece-rates (thus penalising the slow), or, as production went up, of lowering piece-rates and thus causing frustration. Workers with whom he had talked had discounted the value of financial incentives since these offered no hope of greater rations, of more clothes, or of a new house. To the suggestion by one employee that money might usefully be put into national savings, another had retorted: "I put enough in to buy a car; and now I'm going to draw it out to buy a bike." P.A.Y.E. had a further deterrent effect, giving rise to a sense of penalisation. Morale was a long-term issue; and the growth of such institutions as the building society, the football pool, and National Insurance pointed to a general sense of insecurity.

Nevertheless, financial incentives could play an important part in increasing production. Job assessment and subsequent rate-fixing had been fairly highly developed; but these techniques were not readily accepted by managers or operatives.

In one firm £7 15s. had been suggested as the weekly pay to day-workers for 133% of the production achieved by piece-workers. First of all, the employers convinced the union that this was not a capitalist plot. Then the workers' representatives persuaded operatives that the new system should be tried in one small department. Next, two operatives were trained as experts in job-analysis and redeployment so that they could see fair play. Now one department after another was asking for the new system. The purpose behind the reorganisation and redeployment was to employ skilled workers for skilled work and to use the unskilled as service people. The scheme had been accepted because (1) all except the very old and the disabled were now earning more, and (2) workers understood that behind the scheme was good sense and not merely self-interest.

In three other factories industrial consultants who were called in to institute a similar scheme demanded and assumed dictatorial powers. They failed in their purpose; the question in the workers' mind was who was going to get the sack.

Incentives would not work without reasonable social and environmental conditions. Very large increases in productivity could be achieved by reorganisation to make the best use of skilled labour, and by scales of payment in which reward was related to skill, effort, and efficiency; and these scales should be based on factors easily identified and checked. In some industries, notably cotton, wage-rates were complicated and confused because they had been gradually evolved through a series of battles fought and won by the workers; each of these victories meant much, and there could be no going back. In the cotton industry reorganisation of the wages system might be expected to increase production by 20%; an elegant solution had been advanced but both managers and operatives objected.

Another technique was to promote efficiency consciousness, perhaps through efficiency competitions. Finally, in the work of reorganisation teams should not be broken up by changing from group bonus to individual bonus. Rates of payment were linked with morale and prestige; and where under new scales one group became relatively worse off, morale fell.

#### DETERRENENTS

Dr. A. T. M. WILSON, of the Tavistock Institute of Human Relations, suggested that present concepts of incentives and deterrents were inadequate because they were associated with a primitive view of motivation epitomised in the story of the donkey, the carrot, and the stick. Despite lip-service to a wiser philosophy, this was still the concept in the background of effective policy in large industries. It was a dangerous idea because it had no virtue in explaining or predicting behaviour.

Throughout life people were members of one group or another, and behaviour was influenced by the groups of which they were or had been members; and differences in behaviour inside and outside the factory could be related to differences in human conditions in these two spheres.

Observation of a Service group had shown that (1) the urge to constructive activity is a natural impulse which, under proper conditions, will always find expression; and (2) without imposed discipline the group will devise and enforce its own discipline.

In the United States workers were asked to name what changes they sought. They called only for removal of disciplinary time-keeping and for slight adjustment of wage-rates. These changes were adopted and production rose above the maximum said to be possible by production engineers.

Attempts to popularise brown bread had been made (1) by ordinary publicity methods; and (2) by inviting key housewives to join small discussion groups in which the purpose of the change was explained. With the second method the effect was better and more persistent, for it was achieved by group decision.

The implication of these studies for industry was that autocratic action could not succeed; it was impossible to impose even good will successfully. The Hawthorne experiment in the United States had shown that with each change in working conditions production increased; but there was parallel increase in production by the control group. The reason was that awareness of interest rather than the actual changes encouraged the workers to greater effort. Research-workers must implement their knowledge in association with workers and not by doing things to or for them.

In one factory a wages policy worked out by consultants was rejected by the employees, who then worked out their own scheme. This scheme, adopted two years later, was indistinguishable from that of the consultants.

Willing participation of the ultimate consumer must be sought from the start. In industry safety devices were often ignored because they had not been discussed with and accepted by the workers.

#### CONCLUSIONS

In summing up, Mr. ALEC RODGER, senior psychologist, Admiralty, said that scientists must either leave their cloisters for the field or open up their laboratories for the solution of technological problems. In this field the help of the statistician was obligatory. It was also imperative that in each part of the field groups of experts should scrutinise plans for research and ask: (1) what problem was to be solved; (2) how important this problem was; and (3) if really important, whether the proposed method was the best way of solving it. Improved methods must be sought for communicating findings to various people, ranging from the operative to the politician. Finally, research-workers should gain closer understanding of the work of administrators and others whom they advised; this would both improve the quality of research work and make the research-worker more acceptable. Resistance to improved techniques was as great among managers as among workers.

## LONDON TEACHING HOSPITALS

THE Minister of Health has issued an order<sup>1</sup> designating 26 teaching hospitals in the London area, comprising a total of approximately 60 constituent hospitals. Each teaching hospital will be administered by a new board of governors, who will shortly be appointed by the Minister when he has considered the nominations and recommendations of the authorities and organisations concerned.

Under the Act these teaching hospitals have been given a separate identity and status, and, besides treating the sick, they will provide facilities for clinical teaching and research for the undergraduate medical and dental schools and postgraduate institutes of the University of London. As the group comprising each teaching hospital will be one entity for administration, some have been given a new title. But the Minister wishes the names of the constituent hospitals, many of which are of long standing and have valuable associations and traditions, still to be used for everyday purposes.

An earlier order,<sup>2</sup> designated teaching hospitals in the provinces.

*Royal Hospital of St. Bartholomew.*—St. Bartholomew's Hospital (including Alexandra Hospital for Children with Hip Disease and Zachary Merton Convalescent Home, Northwood).

*London Hospital.*—London Hospital (including Croft Home and Marie Celeste Annexe, Reigate; Zachary Merton Annexe, Banstead; London Hospital Annexe, Brentwood; and Herman de Stern Convalescent Home, Felixstowe); Queen Mary's Maternity Home, Hampstead.

*Royal Free Hospital.*—Royal Free Hospital (excluding the Eastman Dental Clinic); London Fever Hospital; Elizabeth Garrett Anderson Hospital (including Rosa Morrison House, New Barnet, and Garrett Anderson Hospital Maternity Home, Belsize Grove); Hampstead General and North-West London Hospital; Children's Hospital, Hampstead; North-Western Hospital (L.C.C.).

*University College Hospital.*—North London or University College Hospital (including Obstetric Hospital and Royal Ear Hospital, Huntley Street); Hospital for Tropical Diseases; St. Pancras Hospital (L.C.C.).

*Middlesex Hospital.*—Middlesex Hospital and Cancer Wing (including Middlesex Branch Hospital and Hulke Endowed Convalescent Home, Clacton-on-Sea); Woodside Hospital for Functional Nervous Disorders (including the country branch, Welders House, Chalfont St. Peter, Bucks); Hospital for Women, Soho Square; British Red Cross Society's Clinic for Rheumatism, Peto Place.

*Charing Cross Hospital.*—Charing Cross Hospital; Harrow Hospital; Wembley Hospital.

*St. George's Hospital.*—St. George's Hospital (including Atkinson Morley Convalescent Hospital, Wimbledon); Victoria Hospital for Children (including Victoria Convalescent Home, Broadstairs); Princess Beatrice Hospital; Royal Dental Hospital.

*Westminster Hospital.*—Westminster Hospital (including the convalescent homes at Chartham Park, Sussex, and Swanley, Kent, and Yarrow Home for Convalescent Children, Broadstairs, Kent); Infants Hospital; Gordon Hospital for Diseases of the Rectum and Colon; All Saints' Hospital.

*St. Mary's Hospital.*—St. Mary's Hospital (including Joyce Grove House, Nettlebed, Oxon, and Adair Lodge, Aldeburgh); Paddington Green Children's Hospital (including convalescent homes at Clear Springs and Pinecroft, Lightwater, Surrey); Princess Louise Kensington Hospital for Children (including convalescent home at 19-20, South Terrace, Littlehampton); Samaritan Free Hospital for Women; Western Ophthalmic Hospital; St. Luke's Hospital for Advanced Cases.

*Guy's Hospital.*—Guy's Hospital (including York Clinic, Nuffield House, and Holmesdale, Nutfield, Surrey); Evelina Hospital for Sick Children (including Eleanor Wemyss Recovery and Convalescent Home, Crazies Hill, near Reading).

*King's College Hospital.*—King's College Hospital (including Baldwin Brown Convalescent Home, Camberley); Royal Eye Hospital or Royal South London Ophthalmic Hospital (including Royal Eye Hospital Branch, Surbiton); Belgrave

Hospital for Children (including convalescent home at Minstead, Hants).

*St. Thomas's Hospital.*—St. Thomas's Hospital; Royal Waterloo Hospital for Children and Women; General Lying-in Hospital; Grosvenor Hospital for Women; Roffey Park Rehabilitation Centre, Horsham, Sussex.

*Hammersmith, West London, and St. Mark's Hospitals.*—Hammersmith Hospital; West London Hospital; St. Mark's Hospital for Cancer, Fistula, and Other Diseases of the Rectum.

*Hospital for Sick Children.*—Hospital for Sick Children (including Tadworth Court Branch Hospital, Tadworth, Surrey; "Runabouts" Convalescent Home, Chipping Norton, Oxon; and Sarah Louise Convalescent Home, Hove, Sussex).

*National Hospitals for Nervous Diseases.*—National Hospital, Queen Square (including National Hospital Convalescent Home, Finchley); Maida Vale Hospital for Nervous Diseases.

*Royal National Throat, Nose, and Ear Hospital.*—Royal National Throat, Nose, and Ear Hospital (including Central London Hospital Division, Golden Square Hospital Division, and Dame Gertrude Young Memorial Convalescent Home, Castle Bar Hill).

*Moorfields, Westminster, and Central Eye Hospital.*—The Moorfields, Westminster, and Central Eye Hospital.

*Bethlem and Maudsley Hospitals.*—Bethlem Royal Hospital for Nervous and Mental Disorders, Beckenham; Maudsley Hospital.

*St. John's Hospital for Diseases of the Skin.*—St. John's Hospital for Diseases of the Skin.

*Hospitals for Diseases of the Chest.*—Hospital for Consumption and Diseases of the Chest (including Brompton Hospital Sanatorium, Frimley, Hants); London Chest Hospital (including London Chest Hospital Annexe, Arlesley, Beds).

*Royal National Orthopaedic Hospital.*—Royal National Orthopaedic Hospital (including country branch and convalescent branch, Stanmore).

*National Heart Hospital.*—National Hospital for Diseases of the Heart (including country branch, Maids Moreton, Bucks).

*St. Peter's and St. Paul's Hospitals.*—St. Peter's Hospital for Stone and Other Urinary Diseases; St. Paul's Hospital for Urological and Skin Diseases.

*Royal Cancer Hospital, Queen Charlotte's and Chelsea Hospitals.*—Royal Cancer Hospital (Free); Queen Charlotte's Maternity Hospital; Chelsea Hospital for Women (including Chelsea Hospital Convalescent Home, St. Leonards-on-Sea).

*Eastman Dental Clinic.*—Eastman Dental Clinic.

## AFTER THE PLEBISCITE

IN a statement issued after a meeting on May 5, the council of the British Medical Association said:

"The council's view is that the profession should recognise firstly that on some fundamental issues the profession has gained a substantial victory and, secondly, that the profession must now prepare itself by continued solidarity to strive for improvements by every means at their command. We shall need as never before a strong organisation and a united profession. We have learnt what can be achieved by solidarity, even if that achievement is not enough.

"The council advises the profession to stand together and to strengthen the one representative body of the profession, the British Medical Association. It appeals to those members of the profession who have shown by their votes their grave misgivings to accept the fact that an insufficient number of general practitioners share their view. The Minister has appealed to the profession to coöperate. The time has come to do this to the best of our ability, though with unrelenting vigilance. In this way the strength of the negative vote will not be lost in the many and important negotiations which lie ahead."

The council has accepted the Minister's invitation immediately to enter into discussions on the Amending Bill and other matters, "his attention being drawn to the large section of the profession which is still opposed to the service and whose good will is essential if the service is to succeed." A report on such discussions will

1. National Health Service (Designation of Teaching Hospitals (No. 2)) Order, 1948. H.M. Stationery Office. 1d.

2. See *Lancet*, April 10, p. 571.



be made to the Representative Body on May 28. The council will recommend to the Representative Body:

(a) That, despite the insufficiency of the safeguards to the profession's freedoms and the misgivings of a substantial section of the profession, the Representative Body, anxious as ever that in the public interest a comprehensive health service should be made available to the community, is prepared to advise the profession to coöperate in the new service on the understanding that the Minister will continue negotiations on outstanding matters, including terms and conditions of service for consultants and specialists, general practitioners, public health officers, and others.

(b) That the Representative Body urges the profession to maintain its strength and unity in order to mould the service in accordance with the public interest and with enlightened professional opinion, and continuously to protect the profession's legitimate freedoms and interests.

(c) That the public be informed that, for reasons outside the control of the profession, the inception of the new service cannot be followed for some time by all the improvements promised by the Government in the medical services of the country, because of the shortage of personnel, medical and nursing, and of the difficulty of providing the necessary premises and equipment.

### A CENTURY OF PUBLIC HEALTH

ON May 7 the Corporation of the City of London held a dinner in the library of Guildhall to celebrate the centenary of the Public Health Act of 1848.

Mr. ANEURIN BEVAN, Minister of Health, proposed the toast of the Pioneers of Public Health—the men who had made possible a comprehensive service for the health of the public. In 1848, he said, they were faced with an appalling task, complicated by the bitter opposition of vested interests. At that time none thought public health a good investment: even leading Radicals ignored it, and John Bright during his twenty years in Parliament spoke only once on the topic, and then to oppose a measure for smoke abatement.

The men whom he specially wished to recall, Mr. Bevan said, were Edwin Chadwick, John Simon, F.R.S., who was appointed M.O.H. for the City in 1848, and William Farr. With them he coupled the name of Lord Morpeth, who steered the Public Health Act through Parliament after one failure, where the unyielding Chadwick would have failed. No social reform, Mr. Bevan concluded, could come to fruition until the public accepted it or could be induced to tolerate it, and the politician's part was to modify ideas while keeping intact the kernel of principle.

Sir GEORGE ELLISTON, chairman of the public-health committee of the Corporation, welcomed among the guests three past Ministers of Health—Lord Addison (a son of the City hospital of St. Bartholomew's), Lord Kennet, and Mr. Ernest Brown. He was glad to remember that Simon had founded the Society of Medical Officers of Health and was its first president.

Lord ADDISON, replying for the guests, turned to later developments in the progress of public health. He recalled the committee on which he himself had served in 1917, with Lord Milner, Arthur Henderson, and Beatrice Webb, which in two weeks decided that a Ministry of Health should be established. After the 1914-18 war, as Minister of Reconstruction, he had worked to implement this decision, till in October, 1918, formal blessing was given to the Bill setting up the Ministry.

The BISHOP OF LONDON, who also replied, sympathised with Mr. Bevan as one who had often to deal with aggrieved parishioners. Sir ALFRED WEBB-JOHNSON claimed Sir John Simon as a surgeon, for he had combined his public-health work with active surgery and had been president of the Royal College of Surgeons. The Act of 1848 had brought great progress in public health. Today, Sir Alfred believed, we were on the eve of great developments in the care of the sick.

Lord BALFOUR OF BURLEIGH proposed the toast of the Lord Mayor and the Corporation, and the LORD MAYOR, Sir Frederick Wells, replied.

In the picture gallery the guests were able to study an exhibition of documents arranged by Dr. Charles White, the present M.O.H. for the City, showing the Corporation's concern for public health during the 500 years before the Act of 1848.

## Disabilities

### 4. DOUBLE FOREARM AMPUTATION

THE injury for which I had both forearms amputated below the elbow took place in May, 1942. Before I received my artificial limbs in the following December, I was in a small hospital in Surrey under treatment for shrapnel and blast injuries to my eyes. While there, I fed, washed, and shaved myself with the aid of two chamois-leather "cuffs" which I tied round the ends of my stumps with tapes. Each cuff had a small sleeve into which I put a spoon, fork, razor, toothbrush, pencil, or other implement. I managed quite well with these "home-made" improvisations. I spent most of my spare time playing bagatelle, holding the cue inside the sleeve of my jacket and using a dent in my bandages as a rest; I eventually became the champion of the hospital.

When my limbs came I determined to use the hands to the fullest extent in preference to the accepted normal working appliance, the "split hook." I have kept to this principle, and I consider that I can do as much with the hands as an amputee using hooks. My hands are of the standard type used by most double amputees, made of moulded linen and glue which is light and strong. The left hand is of the fixed-finger "carrying" type, only the thumb being movable, and the fingers being curved towards the palm to form a natural rest for the handle of a suitcase, bucket, or the like. The right hand has three articulated fingers with knuckle-joints like a real hand; these are not operated mechanically. The thumbs of both hands are opened and closed by a very simple system. By flexing the opposite shoulder and slightly moving the arm away from the body a control cord which runs from the shoulder to the thumb is tightened, and this opens the thumb against the pressure of a spring. When the tension on the shoulder is released the spring automatically closes the thumb against the index finger, which is permanently fixed. The "split hook" and most of the other appliances work on the same principles. With experience the flexing of the shoulders and arms to operate the hands and appliances becomes quite natural.

After a few months the limbs come to feel part of one's natural self. The first hesitation about how to do a particular thing gradually lessens, and soon coördination between mind and limb becomes automatic. Finding the easiest, quickest, and most efficient ways of doing different things with the limbs is a gradual process, mostly of trial and error. For instance, in performing one's toilet, is it better to wash first and then shave, or vice versa? One way round would perhaps save having to put on an appliance twice over. Then the proper placing of the appliances in the bathroom can be the means of establishing a quicker routine. All these small points are worth studying by the double amputee who wants to get the best out of the mechanical aids.

A new form of appliance which greatly simplifies the toilet consists of two rubber sleeves called gauntlets (fig. 1), which are shaped to the stump and held on the limb by suction.

At the end of each gauntlet a metal nipple is mounted on a ball-spring. This metal nipple slips into a recess in the rounded rubber pads which are

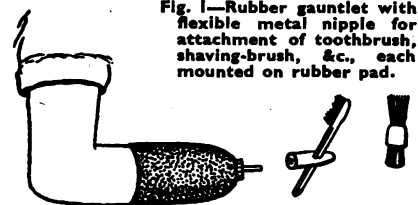


Fig. 1.—Rubber gauntlet with flexible metal nipple for attachment of toothbrush, shaving-brush, &c., each mounted on rubber pad.

attached to one's ordinary razor, shaving-brush, toothbrush, comb, &c. There is also an attachment for holding a face-flannel, with which almost every part of the body can be reached when bathing. I wash my face with a sponge hollowed out to fit over my stump or the gauntlet,

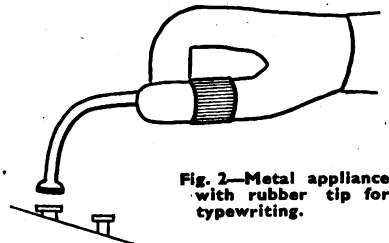
but a face-flannel made into a bag is just as effective. Advantages of the gauntlets are that water cannot harm them, whereas the ordinary appliances are apt to get rusty, and that the feeling of artificiality is considerably less with them than with the limbs.

When dressing I always put my trouser braces over (i.e., outside) the harness of the limbs; this keeps the harness from riding up and, together with having zip fasteners on the fly of my trousers, facilitates visits to the w.c. I have a special appliance for holding the toilet paper, but an ordinary split hook will do as well.

I have the sleeves of my jackets cut a little wider than normal to allow an easy passage for my arms, but no other alterations have been made to my clothes. Some amputees use large press-studs to fasten their clothes, but when the button-holes have been used a little I can fasten and unfasten them quite easily with my hands, provided the buttons are not too small.

My work is clerical; I have charge of a small department in a large public organisation, which entails writing, typing, using telephones, and general office work. For this I use only one appliance, and that is when typewriting. To dial telephone numbers I use the thumb of the left hand, holding the phone with my right; I can hold the phone with either hand and so can make notes while phoning if necessary. I hold a pen or pencil quite easily with the right hand, the pen being gripped between the thumb and index finger at the normal angle, while the first articulated finger is pushed forward to steady the pen and the top of the pen rests against the base of the hand.

For typewriting I use two curved metal projections with rubber tips on the end, held on the thumbs by steel spring clips (fig. 2).



Only a two-finger style of typing is possible, but with practice a fair speed can be attained. I put papers in the machine in the normal way, and experience no difficulty in using it. The articulated

fingers of the right hand have many uses, especially when filing or card-indexing. When not required they can be pushed out of the way into the palm.

Normally, for eating, the hands are removed and a push-in type of knife, fork, or spoon is attached, but I have cutlery of my own design which I use in conjunction with the hands (fig. 3). These are held on the thumbs in a similar manner to the typewriting appliances, and I find them highly efficient and far more natural and easy to carry about than the standard issue. In picking up a cup I grip the handle with the thumb and index finger and steady it at the base with the articulated fingers. But if I am using the eating appliances I drink through a tube of glass or plated steel. As the hands can rotate on the limb it is important to know, at what angle to set the hand in relation to the size and fullness of the cup. This comes with experience—usually after you have spilled one or two cups of coffee down the girl friend's best dress. After a time putting the hand at the best angle becomes automatic whether you are going to pick up a matchstick from the floor or a large object from a shelf. Incidentally, I find little difficulty in opening the average kind of door, either of key or handle type.

Almost everything that a normal person does in a normal day can be done by a double amputee, provided he can do them in his own way and time. Three things which I have not yet learnt to do are to put on my collar and tie (though I am experimenting with this), to lace up shoes, and to take coins or other small articles from

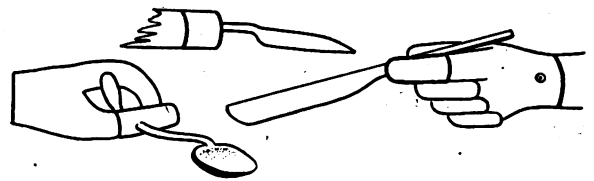
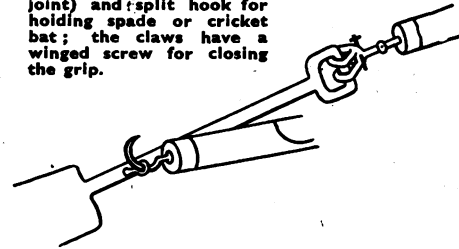


Fig. 3—Feeding appliances: knife of push-in type, for use without hands, and spoon and knife mounted on thimbles to clip on thumbs.

my pockets. I carry fares for bus or tube journeys ready in my hands, and if necessary I can carry the fares for three separate journeys by using the articulated fingers and still leave my operated thumb free for smoking or picking up things.

Odd jobs about the home are well within one's scope, whether it is cleaning shoes or nailing up the fence.

Fig. 4—Claws (with universal joint) and split hook for holding spade or cricket bat; the claws have a winged screw for closing the grip.



I clean shoes with a boot-brush held on an extension which has a lateral and rotary movement, while to knock in a nail I hold it in a pair of tweezers (similar to the split hook) and hit it with a hammer of the push-in type. Paint brushes, saws, chisels, and almost all kinds of tools normally found in the home can be held either in a universal holder or with the hand. I have another appliance (fig. 4) which can grip the handle of a fork or spade, or—for more pleasant pursuits—a cricket bat. I spend much of my leisure doing pen and ink sketches and water-colour painting, holding the pen and brush in the hand as previously described.

Most amputees have their own ways of doing things and approach the same problem from different angles, some preferring appliance A while others get better results with B. We all have our pet theories and ideas and an exchange of views can be of benefit to all.

## Public Health

### Inoculation against Plague and Typhus

THE WHO Expert Committee on International Epidemic Control decided on April 17 to ask the executive secretary of the Interim Commission to make known to national health authorities the following:

"The committee strongly emphasised the fact that, whatever its value as a measure of individual protection within the area of a plague epidemic, anti-plague vaccination had no place as a quarantine measure in the international control of the disease.

"The committee was strongly of opinion that vaccination against typhus, although it conferred considerable protection to the individual, was not justified as an international quarantine measure."

In fact the committee agreed that the use of insecticides with residual action should be the chief measure of international action against these diseases.

This coincides with the opinion expressed on Oct. 16, 1947, by the WHO Expert Committee on Quarantine. This committee's views, endorsed by the Interim Commission, are as follows:

"The committee stressed the fact that inoculation against plague or typhus cannot be required under existing conventions, and observed that such measures had little value for the protection of countries receiving travellers from infected areas.

"In its opinion disinsection of the travellers and their belongings by means of D.D.T. or other efficient insecticides would be more efficacious in preventing the importation of these diseases."

### Vital Statistics for 1947

In the statistics for England and Wales in 1947, announced by the Registrar-General,<sup>1</sup> the excess of live births over total deaths is shown as 369,011. The average natural increase for 1941-45 was 171,516.

Provisional rates per 1000 population as at mid-1947 were as follows: persons married 18.5 (0.5 above the rate for 1946); live births 20.5; total deaths 12.0 (0.5 above the rate for 1946). Stillbirths were 24 per 1000 total births (the lowest on record in this country), and illegitimate live births 52 per 1000 total live births (18 per 1000 below the average for the preceding 5 years). Infant mortality was 41 per 1000 related live births, and is the lowest recorded in this country.

The birth-rate was 1.4 above that of 1946 and was the highest recorded since 1921. The effective reproduction-rate corresponding to the births in 1947 is provisionally assessed at 1.206, indicating that the births of 1947 were 21% in excess of those required to maintain the population; this is higher than for any year since 1920.

## Medicine and the Law

### The Surgeon's Responsibility

A BELGIAN contemporary<sup>2</sup> mentions an interesting decision recently made by the Cour de Cassation in Paris. A woman was admitted to hospital for surgical treatment for ectopic pregnancy. Unfortunately, in the course of some necessary mechanical adjustment of the operating-table, she suffered a fracture of the leg. This was due to a former condition of ankylosis of the knee, of which the surgeon was unaware. The trial court found the surgeon responsible for the accident and awarded compensation to the patient.

The surgeon appealed. He argued that he could not be legally liable since the trial court's decision stated that the fracture was due to the undisclosed ankylosis, and the ankylosis was something entirely independent from the condition which he was called upon to treat. On the other hand it was contended for the patient that the surgeon must have an all-round responsibility for the patient's body as a whole, even if his attention was being primarily devoted to only one part of it. The surgeon rejoined that the particular operation was not one which involved moving the patient's limbs for the purpose of examining their state. Would people expect him to spend time asking a patient all about her antecedents when she was weak and in pain, as this patient was, and with other anxieties to think of than talking about her former knee trouble?

The appellate tribunal decided against the surgeon. The patient, already under the effect of the anaesthetic, was ready for the surgical treatment she needed when the surgeon, who, by his own admission, had made no preliminary examination and so remained in ignorance of any infirmity from which she suffered, gave the direction for the mechanical adjustment of the operating-table. It was this that caused the fracture of the leg owing to the restriction due to the ankylosis. It was the duty of the surgeon to examine the patient, not only in respect of the particular part or place requiring his treatment, but also with a view to discovering any disability or condition which would affect what he, as the practitioner in charge, was undertaking. The Cour de Cassation could not find that the trial court had misdirected itself upon the law.

The decision, which might not be the same in England, puts an awkward duty upon the surgeon and makes a serious addition to his responsibility. The remedy presumably, as a French commentator has suggested, is to secure the attendance of the family doctor, if possible, at the operation.

1. Quarterly Return of Births, Deaths, and Marriages in England and Wales: 1947, Fourth Quarter. H.M. Stationery Office. Pp. 25. 6d.
2. *Scalpel*, April 17, p. 380.

The medical group of the Royal Photographic Society is holding its first exhibition at 1, Wimpole Street, London, W.1, from Monday, May 24 to Saturday, May 29.

## In England Now

### A Running Commentary by Peripatetic Correspondents

It will be nice to have basic petrol back next month, even though we "E" motorists are left to wangle what we can out of our allowances for essential purposes. Those of us who never got more than we really needed (and often much less) must reflect that virtue is its own reward; for the scheme seems to be based on the cynical assumption that we have all been over-claiming for at least 90 miles a month.

The new arrangement will have some odd effects. In the past if we were found in the cinema car-park it was no defence to say that we had saved the petrol by free-wheeling down hills and pushing the car on the level. But in future even if we are attending a race-meeting at Land's End when our home is at John O'Groats we need only say that we have been saving up our monthly allowances for quite a time and the policeman must touch his helmet respectfully and pass sadly on. Motorists are in fact being offered a prize for squeezing every possible mile out of each gallon—a kind of "keep the change" bonus. Already I see Bill up the road riding his bicycle to the station, thus saving his E coupons to take his family to the seaside in August. When the full significance of the new regulations sinks in I expect to see rows of business men riding to the station on the fruit-farm's muck-cart; and when I get an urgent call my reply will be: "Yes, if you send the gardener for me with his wheelbarrow."

Well, the Minister of Fuel might say (if he read these columns), that just shows that these people *have* been overestimating their needs. But does it? To me it shows that many of us value "pleasure" motoring so highly that we are willing to sacrifice our leisure, our dignity, and even our breakfast to get a little this summer. But we look a little bitterly at our non-essential neighbours who can get 90 miles a month by merely applying at the post office.

The Cricket Bore is with us once more after a merciful few months' inactivity. The first signs of this annual menace are unmistakable. Conversation about the weather brings him to the state of the land and thence logically (to him) to cricket pitches. The bat appears in the Bore's room and is reverently oiled and gently fondled during an unasked-for account of its performance last season. A copy of *Wisden* is on the desk and a pair of cricket boots lie newly whitened in the corner of the room. The Bore ecstatically sniffs the air at frequent intervals—apparently his nostrils perceive a fine delicacy and maturity in what, to a non-cricketing observer, seems to be a faintly repugnant odour of rancid oil and sweaty socks. There is much superior talk about county teams and players. And so it will go on all the summer. However, life can be sweet at times. Last season the Bore made a succession of zeros which even he was unable to account for satisfactorily to his frozen-faced non-playing colleagues. The latter, of course are keenly awaiting glad tidings of the first of this season's ducks; but it is just possible that the Bore may put up a good score, and this explains the anxious—nay, hunted—appearance of our non-cricketing types.

There is a great need for a long-term research institute to study the natural history of disease. The ideal situation for such a study would be a medium-sized industrial town with a compact population served by a combined group of hospitals—say a population of half a million. The institute should really be a super-secretarial one, with guiding hands from the professors of medicine, pathology, pharmacology, and child health, whose departments would provide the basic data.

Problems to be investigated might be, to give a few examples: Does bronchial carcinoma occur more commonly in people who were exposed to X rays in infancy? What is the natural history of bronchitis? Do people who were breast-fed babies have a lower requirement rate for artificial dentures? Do carcinogens applied in cases of infantile eczema predispose to cancer in later life?

Some foundation would have to finance the scheme with a proviso that no findings should be published in less than fifteen years.

I boarded the ship late on a stormy Saturday afternoon, and gradually drifted to the after-deck lounge. As the ship weighed anchor and slipped down the Tyne, so the twinkling lights of Newcastle disappeared into the wintry gloom. Snow fell heavily. I thought of the great sailors of ancient days, of the Vikings, of Drake, Rodney, and Nelson, each of whom had watched the receding shores of England from their state cabins in the stern. My chest swelled with pride. "Boy," I said to myself, "this is mighty fine!" The sumptuous supper enhanced that feeling. Catching the eye of a pretty girl across the lounge I felt extremely nautical. But disillusionment was at hand. A few minutes later the ship struck the North Sea, I struck the roof, and the pretty girl the floor. Rapidly I progressed from pink to green, and soon (as the *Week-end Book* puts it) I was indifferent to the fate of the ship. Later, when calm came, I lay flat and comfortable, though weak and dehydrated, in a cabin amidships, meditating on the following:

(1) The gastric juices are very irritating to the nasopharynx; does continued mal-de-mer ever lead to peptic ulceration of the nose?

(2) Are vagotomised people seasick?

(3) If inability to be seasick is a symptom of carcinoma of the cardia (Holmes Sellors), then I have not got carcinoma of the cardia.

Next afternoon the ship still pitched and I remarked to a steward, "Devilish crossing this!" "It isn't really, sir," he replied. "A little ground swell, as the North Sea is so shallow; but as for a rough sea..."

I'm curious to know if there is as much theft at other hospitals as at mine. I hide in the anonymity of this column because if my own hospital is the only one where everyone steals I don't want to expose it.

What gets stolen? Well, nearly everything. If new blankets are issued to the wards they go; if large towels are supplied to the theatres for the surgeons they only stay a few days; lavatory paper is removed as often as it is supplied. Because of this patients are colder, surgeons are damper, and everyone is constipated. The whole standard of hospital comfort could be much higher if only people would be reasonably honest.

I was talking to the head gardener this morning and he told me that he always allows for 20% loss when setting out plants; the other day 19 geranium plants were stolen in an hour while the man planting them went to lunch. We thought it would be a kind act to supply books and magazines for our outpatients and we expected a few to go, but we didn't expect every single one to go on the very first day—which was what happened.

The dishonesty doesn't seem to be confined to any one class. In the hospital library, which only the doctors use, books and periodicals disappear with alarming speed. When I was staying the other week at a well-known Oxford hotel, full of respectable prosperous people, the waiter told me that since the war all their silver teaspoons and silver tankards had gone, and that many guests left with bath-mats, rugs, ash-trays, and table-napkins.

I don't want to sound like a testy old gentleman writing to the *Times*, but I do think standards of honesty are getting lower everywhere. I know it's partly because so many goods are scarce, but I'm afraid that when everything is more plentiful the dishonesty habit will have come to stay.

The other day the gas inspector visited my house. He was carrying the four feet of iron pipe with a small wooden disc at one end which is traditionally strapped to the crossbar of the inspector's bicycle, but this man came on foot. I don't think he knew I was a doctor, for I have no plate up and I was wearing my second best. On my asking what was the weapon he was carrying he paused to build up an atmosphere of mystery and then said with lowered voice, "It's a stethoscope!" I registered appropriate awe and asked what he heard with it, secretly hoping for some lurid description of subterranean rhonchi. He replied, with commendable frankness, "Not much. But you sometimes 'ear a sort o' squeakin' if the main's broke." I sympathised.

## Letters to the Editor

### REPRESENTATION OF SPECIALISTS

SIR,—As your references last week to the British Medical Association's proposals for a representative machinery for consultants and specialists are somewhat incomplete, perhaps you will permit me to explain them in some detail.

No-one will dispute that it is necessary, in the interests of consultants and specialists themselves, as of the whole profession, that there should exist an efficient and democratic organisation to facilitate the collection and presentation of the views of those engaged in consultant and specialist practice to governmental and other bodies. Such an organisation should satisfy certain criteria:

(1) Its authority should be derived from individual consultants and specialists through elected regional committees.

(2) Membership of any particular body—British Medical Association, Royal College or Corporation, or Specialist Association—is irrelevant.

(3) There should be created as the central mouthpiece of such local or regional committees an authoritative body which is autonomous within its field.

(4) Such a body should be able to speak when necessary with the support of the whole profession.

(5) Such a body should have the advantage of the facilities, resources, and experience of the representative body of the whole profession.

The Association has constructed its proposals to meet these requirements. It has put forward a provisional plan for local committees, leaving it to each area to determine the actual composition and mode of election of such committees so as to secure that they are fairly representative of those teachers and non-teachers engaged in consultant and specialist work. It is advising that there should be a linkage between regional consultant committees and local medical committees working in association with local executive councils. It is establishing regional offices to provide clerical and other assistance.

As you point out, the central committee will consist, for the most part, of the nominees of local committees. It is the Association's intention that the central committee, representative of members and non-members of the Association alike, should have a standing similar to that enjoyed for many years by the Insurance Acts Committee for insurance practitioners. The latter committee, representative of Local Medical and Panel Committees, enjoys autonomy in dealing with matters affecting insurance practitioners, enjoying the support of other branches of the profession from time to time through the Council of the British Medical Association. It derives its authority from an Annual Conference of representatives of Local Panel Committees, and if it is desired by consultants the Association's proposals will be extended to include an annual conference of consultants and specialists. The representative machinery for insurance practitioners has worked with very considerable success, an important element in this success being the relatively independent position which it has maintained.

The Association's plan is to create within its framework a genuinely representative regional and central organisation for consultants and specialists which, backed by the Association's resources in the region and at the centre, will give consultants both their proper autonomy and their opportunity to cooperate with and receive assistance from other branches of the profession as occasion may arise. In the future, as in the past, there will be occasions when the profession will need to stand together as one united body, and any system of organisation which tended to deprive consultants either of their proper autonomy in their own affairs or of their proper place within an organisation representative of the whole profession would be harmful to their interests.

It is for others to decide whether the Royal Colleges and other specialist bodies are properly equipped by their constitutions and outlook to deal with problems of organisation and conditions of service. It is the duty and intention of the British Medical Association, which

is predominantly concerned with this type of work, so to amend its constitution as to meet the present-day needs of consultants and specialists.

CHARLES HILL

Secretary, British Medical Association.

B.M.A. House, Tavistock Square, London, W.C.1.

SIR.—It is clear that there is widespread anxiety amongst consultants and specialists as to the most suitable body to represent their views and interests. There is at present a choice between the Royal Colleges, the B.M.A. Consultants and Specialists Committee, the Association of Major (Non-Undergraduate Teaching) Voluntary Hospitals, the London Consultants Committee, &c.; and now we have proposals, on the one hand, from the British Medical Association for new Central and Regional Consultants and Specialists Committees, elected along democratic lines, and on the other hand, from THE LANCET for a new body based largely upon the Royal Colleges and teaching hospitals, with no evidence of a democratic constitution.

Under these circumstances, and particularly in view of the present emergency, the undersigned members of this hospital strongly support the immediate formation by the British Medical Association of new Central and Regional Consultants and Specialists Committees, provided that they consist solely of consultants and specialists, with an independent secretariat, that their decisions should not be subject to being overruled by the Representative Body, and that these should be taken as being the policy of the association in matters relating solely to consultants and specialists.

C. HEYGATE VERNON,  
Chairman, Medical Council.

N. F. ADENEY  
Vice-Chairman.

C. E. P. MARKBY  
Hon. Secretary.

Royal Victoria and West Hants Hospital,  
Bournemouth.

#### EPIDEMIC NAUSEA

SIR.—The note in your issue of May 8 causes me to submit a record of an epidemic in a girls' preparatory boarding-school in East Sussex.

On the evening of Feb. 4 this year, 13 children out of a fluctuating population of about 43 were attacked with dizziness, abdominal pain, and nausea. Of these 13, 11 had spent the afternoon in a nearby town where they had travelled by bus; 1 had spent the afternoon practising the piano in the school; and 1 had been to London for the day. Vomiting was not prominent or persistent, and mild diarrhoea occurred in 3; in these cases the stools were semi-formed, with no blood and scanty mucus. The abdominal pain may have been partly due to retching produced by the nausea.

Further outbursts took place at roughly 48-hour intervals, and by Feb. 24, when I visited the school, 31 patients were confined to bed, including 2 adults—a nurse and a mistress. Temperatures occasionally rose to 99°F, usually with bradycardia. In bed the patients felt well, but on getting up they complained of faintness and giddiness, sometimes very severe. I could find no ataxia, nystagmus, or other signs of labyrinthine, aural, or organic nervous lesion, and no indication of gastro-intestinal disease.

Bacteriological examinations had been performed on the stools of 24 individuals, and 4 were found positive for Morgan's bacillus. Meals were taken in a staff room by 3 of these persons—the nurse, a mistress, and the chef who prepared the food for the whole school. The other case was the child of the mistress using the staff room. All other cases were negative on repeated examination for the usual pathogens. It was my opinion that, as in the cases reported by Hargreaves,<sup>1</sup> the occurrence of Morgan's bacillus was incidental and not significant. No source of probable infection from any other organism was traceable.

A notable and rather perturbing feature was the duration of the symptoms, which had lasted 3 weeks when I first saw the cases and persisted for 2–3 weeks longer. I thought at first that these children, lying, as was inevitable, in the general dormitories—for the whole school was disorganised—had nothing to do but watch each other and that there was hysterical perpetuation of

symptoms. On the other hand, the nurse, who had herself been ill for some days, was emphatic that the vertigo the day before I saw her was very severe, attacking her suddenly when she had got up feeling well, and causing such loss of sense of position that she could not grasp anything to support herself, since nothing was where she thought it was. A further original possibility—that the persistent nausea was due to prolonged sulphaguanidine administration—was later dismissed, as the symptoms continued for some time after its omission.

The final solution had to be to allow most of the children to return home. One was later found by electrocardiography to have repetitive paroxysmal tachycardia—presumably an incidental complication. Otherwise no troubles have persisted so far as is known. During its course, however, the condition was distinctly harassing and unlike any other epidemic I have seen. It certainly gave the impression of being a clinical entity.

Hove.

W. A. BOURNE.

#### FATTY LIVERS IN THE WEST INDIES

SIR.—Anyone who has had to summarise a long paper in a few paragraphs knows how difficult it is to give an exact picture of the original. In your annotation of May 1 there are certain passages which may be misleading. It is not correct to say that the babies were fed mainly on bush tea (para. 2), nor that they showed continued growth (para. 3). Fat analyses were made on post-mortem tissues, and not, unfortunately, on biopsy material: the sentence "biopsy specimens commonly contained exogenous neutral fat . . ." states as a fact what cannot be more than an inference. Finally, to say that the group of syndromes under discussion occurs in "tropical and subtropical Africa, America, Ceylon, China, and Haiti" is both too positive and too exclusive.

These points are small in themselves, but they obscure a central part of the argument. In my report two groups of cases are contrasted—babies with fatty liver, and babies with severe general malnutrition but with no gross liver lesion. What is the cause of the difference? The dietary history was much the same in both groups; both had been living mainly on starchy paps. In both groups there was much weight-loss, but less in the babies with fatty liver than in the others (30% compared with 50%). These babies, moreover, were relatively well covered with subcutaneous fat, whereas in the generally malnourished infants all fat was lost. Unless there were differences in absorption, about which we have no evidence, these facts suggest that the food intake, and particularly the carbohydrate intake, had been greater in the babies with fatty liver than in the others.

There is a clear analogy between these clinical observations and the results of experiments on rats by Best, Griffith, Handler, and others. These workers have shown that even when the diet is such as to produce a fatty liver—i.e., deficient in lipotropic factors—the liver will not become fatty unless there is an adequate caloric intake; within certain limits, the amount of liver fat may be proportional to the food intake. It has also been shown in rats that fatty liver is enhanced when the animal is growing, because there is then an extra demand for lipotropic factors. This latter point is not directly applicable to the human babies, for it would be impossible to maintain that they showed continued growth when the body-weight was 30% below standard. It may, however, be relevant to the more general question of why fatty liver seems to occur more easily in infants and young children than in adults.

The suggestion then is that, other things being equal, the difference between general malnutrition and fatty liver disease is that in the latter there is a relative overloading with carbohydrate. I have emphasised this theory, in an attempt to get away from the simple search for a missing factor, to a wider conception of an unbalanced metabolism. Animal experiments again suggest that the fat deposited in the liver in these circumstances is exogenous—i.e., derived directly from the food—whereas the fat that sometimes accumulates in the liver in infections or starvation is endogenous, coming from the body depots. This distinction may have implications for treatment.

1. Hargreaves, E. R. *Brit. med. J.* 1947, 1, 720.

This argument leads to a further conclusion. The syndrome described here should not be looked upon as an odd disease, found in babies fed peculiar diets in the tropics, but as a condition which may occur anywhere if the baby's food is low in protein and high in carbohydrate. Véghelyi has described it in Budapest. It is probably identical with the condition known as *Mehlnährschaden* in Germany—an identity that has recently been emphasised by Altmann.<sup>1</sup> It may also perhaps occur as a conditioned or secondary effect, as you suggested on March 27 (p. 491).

Little is known about the distribution of the disease throughout the world. It is easy to miss unless a fatty liver is found at autopsy, or unless there are superficial signs—lesions of skin and mucosæ. The occurrence of these may be related more to local variations in the diet than to the fundamental disease process. Kwashiorkor in its classical form presents many such signs; it has been described in many tropical and subtropical countries, and to the list given in your annotation may now be added Egypt and Brazil. It appears, however, to be very rare in the Far East. But if kwashiorkor is only a variant of a wider process, it is probable that the less obvious forms will be found in the Far East too if they are looked for. This belief is borne out by personal observations of those who have worked there—observations, however which have not been published, and which still have to be confirmed.

Finally, the occurrence of obvious, clear-cut cases is not a certain guide to the distribution of the syndrome. In the West Indies, for instance, such cases were not common; but 10% of 800 unselected babies were found to have enlargement of the liver, not attributable clinically to malaria or syphilis. These babies were in no ordinary sense ill; but in the few cases in which biopsy was done the liver contained fat, which disappeared on treatment. This suggests that mild grades of the disorder may be endemic.

J. C. WATERLOW.

Medical Research Council, Human Nutrition Research Unit,  
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**ASSOCIATION OF MEDICAL RECORDS OFFICERS**

SIR,—Readers who are interested in medical records may recall a letter which appeared in your issue of June 14, 1947. It was then envisaged that improved methods of record keeping might be achieved by the provision of trained lay assistants. The suggestion made was the inauguration of an association of qualified records officers to organise training courses for lay personnel responsible for the care and maintenance of medical records.

An Association of Medical Records Officers has now been inaugurated; and the medical profession will no doubt give their coöperation and guidance as they have always done in such matters in the past. Two of the association's aims are:

1. To promote the development of techniques in medical record keeping, to diffuse among the members and others all information and technical and general knowledge from time to time available regarding the keeping of medical records or of use in connexion therewith.
2. To provide opportunities by means of lectures, discussions, or other intercourse amongst the members for the exchange of information and opinions regarding the method, processes, and technique of medical record-keeping.

Training courses for lay personnel already responsible for medical records are being organised in several of the regions as an interim measure, preparatory to a more comprehensive scheme of training. Records officers interested in these training courses and in membership of the association are invited to get in touch with the honorary secretary.

Public Health Department,  
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B. BENJAMIN  
Chairman of Council.

Christie Hospital and Holt Radium  
Institute, Wilmslow Road,  
Manchester, 20.

ELSIE ROYLE  
Hon. Secretary.

1. *Clin. Proc., Cape Town, 1948, 7, no. 1.*

**HELPING THE OLD**

SIR,—Reading the note in your issue of Feb. 21, it occurred to me that members of the medical profession may often be at a loss to know where to send people who, for instance, seem to be in need of extra nourishment or of treatment for their feet, or who are short of coal or in difficulty about their rations because of the need to stand in queues. I wonder whether it would be helpful for them to know that in most large towns and in some of the small country ones, as well as in most districts of London, the Citizens' Advice Bureau, originally set up as a war-time service, is still actively at work, and is prepared to give advice and information on all problems of this kind as well as on many others relating to supplies and rationing, housing difficulties, social insurance, health services generally, and a multitude of personal and domestic questions which are being brought to them in increasing numbers by many families who used the bureau for emergency help during the war.

We should be very glad to give further information about the bureau service to any doctor who would like to have it, together with a list of the bureaux.

K. M. OSWALD

Secretary, Citizens' Advice Bureau Department,  
National Council of Social Service.

26, Bedford Square, London, W.C.1.

**REMUNERATION OF PRACTITIONERS**

SIR,—It seems to me that the present proposals of the Minister of Health fall short of those of the Spens report, which he has accepted. The committee had in mind a capitation fee of 15s. at the 1939 value of money. (Admittedly this was stated to be an outside figure.) The Chancellor of the Exchequer is reported as stating in the House of Commons that the purchasing power (value) of the £ fell from 20s. in 1914 to 12s. 4d. in 1937 and 7s. 8d. at the end of 1947. Assuming that the 1939 value was not materially different from that in 1937, the present-day equivalent of 15s. at 1939 value should be 24s. 2d.

The Minister proposes a capitation fee of 15s. 2d. if 95% of the population come in and 17,900 principals join. In addition he gives a basic salary of £300, and the Treasury pays 8% of the practitioners' emoluments into a superannuation fund. What does all this actually amount to? Here is an example:

The remuneration for 1000 patients would be:

Basic salary	£300
1000 capitation fees at 15s. 2d.	758
	1058
Plus superannuation fund contribution 8% of £1058	85
	£1143

Under the Spens Committee proposals (as adjusted) 1000 capitation fees of 24s. 2d. would be £1208.

Here is a comparative table:

No. of patients	Minister's proposals				Effective capitation fees	Spens report as augmented to present-day values
	Salary	Capitation fees at 15s. 2d.	8% Superannuation fund	Total		
1000	£300	£758	£85	£1143	22s. 10d.	£1208
2000	£300	£1516	£157	£1973	19s. 9d.	£2416
3000	£300	£2275	£206	£2781	18s. 6d.	£3624
4000	£300	£3033	£267	£3600	18s. 0d.	£4832

The whole of the above figures are based on gross incomes. To calculate the amounts which would be available for the private and personal use of a doctor and his family they must be reduced by something like a third.

I understand that the Minister's proposals were calculated to give practitioners something like 20% more than what their net remuneration in 1938-39 would have been if the recommendations of the Spens Committee had been in operation that year. They may have been worked out on these lines:

No. of patients	Minister's proposals			Spens report at 15s.	Spens report at 15s. plus 20%
	Salary and capitation fees	Super-annuation at 8%	Total		
1000	£1058	£85	£1143	£750	£900
2000	£1816	£157	£1973	£1500	£1800
3000	£2575	£206	£2781	£2250	£2700
4000	£3333	£267	£3600	£3000	£3600

As regards superannuation, general practitioners have been treated generously compared with salaried medical officers in local-government service. There is, however, a small class of men who have been neglected altogether—namely, the practitioners who will be over 60 years of age when the service starts. I would suggest that a small sum should be set aside by the profession from the global sum of £66 million to deal with cases of this sort.

Worthing, Sussex.

HAROLD LEESON.

#### TREATMENT OF APOPLEXY

SIR,—Gilbert and de Takats<sup>1</sup> have lately reported promising results from the treatment of apoplexy by stellar-ganglion infiltration. This procedure is based on the hypothesis, clinically and experimentally well founded, that cerebral hæmorrhage, if induced by arterial hypertension, thrombosis, or embolism, is preceded and/or followed by spasm of cerebral arteries.

On the same hypothesis we have for several years treated incipient apoplectic attacks with intravenous injections of aminophylline (0.24 g.). In five cases of sudden and complete loss of consciousness with absence of pupillary reaction and corneal sensation, bilateral positive Babinski sign, and profound respiratory disturbance, we were able to give this treatment within 20 minutes of the onset. The patients came out of coma within 3-5 minutes of the injection, and though neurological signs (Babinski) persisted for 24-48 hours, permanent cerebral damage was observed in only one (aged 84) and hemiplegia or monoplegia in none. A detailed account of four cases is to be published in a Swiss periodical<sup>2</sup>; the fifth was observed after the paper was completed. Where this treatment can be promptly applied the immediate result is astonishing.

F. MAINZER

Alexandria.

Consultant physician to the Jewish Hospital.

#### UNUSUAL CAUSE OF SPASM OF PSOAS MUSCLE

SIR,—In his interesting communication of May 1 (p. 676), Dr. Poniedel describes the full syndrome and sequence of a left upper pole renal carbuncle with perinephritis and a secondary pleural effusion. His earlier clinical judgment was almost certainly correct. Decision was made more difficult (a) by the employment of penicillin before a diagnosis was made at another hospital, and (b) by the investigations later undertaken. The renal carbuncle is almost invariably subcapsular and for this reason pus cells seldom appear in the urine and pyelography is of dubious value. In the days before penicillin and over-reliance on radiography, the history, loin pain, and tenderness in the renal angle and a rising leucocyte-count would have clinched the diagnosis, and a well-timed incision in the loin would have revealed either an abscess or inflammatory induration of the connective tissues above the kidney. I have never known inflammation of the pleura originating above the diaphragm to cause psoas irritation. Renal carbuncle and perinephric abscess occur predominantly in males. In the majority of cases a history can be obtained of a

boil or other staphylococcal skin infection during the weeks preceding the first symptoms. In this case the primary focus may possibly have been tonsillar. The recovery of pneumococci from a clear pleural fluid after a lapse of nearly three months from the onset of the illness has no great significance and need not, I think, invalidate the above interpretation.

Oxford.

JOHN A. RYLE.

#### SENSITISATION OF PENICILLIN-RESISTANT STAPHYLOCOCCI

SIR,—Dr. Barber may well be correct in her suggestion last week that the variations in penicillin sensitivity observed by Dr. Voureká and myself are due to spontaneous mutation. Whether or not contact with other organisms or their extracts affected the sensitivity of the staphylococci in question, one fact emerges clearly: it is that sensitivity or resistance of staphylococci to penicillin is an extremely labile property. The nature of this property, and the factors determining its acquisition by any given organism, are as yet undetermined.

One further point. Is it strictly correct or desirable to refer, as Dr. Barber does, to "100% sensitivity"? Penicillin resistance or sensitivity is quantitative and measurable, and is better expressed always in terms of the amount of penicillin to which the organism is either just tolerant or just intolerant.

H. I. WINNER.

L.C.C. North-Western Group Laboratory,  
London, N.W.3.

#### ANTI-ANÆMIC SUBSTANCES FROM LIVER

SIR,—The question of the efficacy of certain hæmopoietic materials against subacute combined degeneration was raised last week in your leading article and in the letter from Dr. Wilkinson and Dr. Israëls. The effectiveness of an agent against the neurological manifestations of pernicious anæmia can be assessed in two ways:

1. By determining whether maintenance therapy with the material will prevent the development of symptoms referable to the nervous system. This is an indirect method demanding protracted observation of numerous cases. Even if treatment is ineffective—as in patients receiving folic acid or inadequate amounts of liver extract—a year or more may pass before neurological symptoms develop.

2. By observing the effects of the agent in established cases of subacute combined degeneration of the cord. Experience during the last twenty years has shown that doses of liver extract considerably in excess of the minimum required to maintain a normal blood picture not only prevent any deterioration in the neurological condition but may even lead to considerable improvement. To assess this improvement quantitatively I use a method which involves frequent neurological examinations by the same physician. Each examination is made under carefully controlled conditions and without reference to previous findings. The symptoms and signs are recorded by a third person who acts as an observer. A system of scoring permits of their quantitative evaluation with assessment of the "total neurological defect." By applying this method to groups of cases and expressing results as percentage of the original disability, one can obtain an average curve of improvement.

Results based on 44 cases of subacute combined degeneration of the cord followed for several years permit the following conclusions:

1. Improvement is progressive during the first six months, after which the neurological condition remains unaltered. The residuum of symptoms and signs is presumably attributable to irreversible changes in the nervous system.

2. The degree of improvement attained in six months depends above all on the duration of difficulty in walking.

The degree of improvement obtained in 16 cases treated with refined liver extract (Dakin and West) did not differ significantly from that in 28 cases treated with crude liver extracts.

In the past six months, 3 patients with subacute combined degeneration of the cord have been treated for periods of 21, 12, and 10 weeks with the highly purified pigmented material prepared from liver by Lester Smith. In each case there has been progressive

1. Gilbert, N. C., de Takats, G. *J. Amer. med. Ass.* 1948, 136, 659.  
2. Mainzer, F. *Schweiz. med. Wschr.* (in the press).

decrease in neurological symptoms and signs, the score, for "total neurological defect" being correspondingly reduced. The degree of improvement has been in no way inferior to that observed in comparable cases treated with crude liver extract.

Although these preliminary observations are encouraging, final conclusions cannot be reached until more patients have been treated for longer periods with the purified material.

A full account of these findings with details of the methods employed was given to the Association of British Neurologists on April 10 and will be published in due course.

C. C. UNGLEY.

Royal Victoria Infirmary, Newcastle-upon-Tyne.

#### ATTACK ON RHEUMATISM

SIR,—I have followed with great interest the correspondence which has arisen from your leading article of March 27. Probably the reason why so little progress has been made in this field is that sufferers from rheumatism have been tossed hither and thither, no real interest having been taken in them or their complaint. Clearly, if we are to progress—and the economic and social incubus of this group of diseases demand that we shall—our only hope is to have patients treated in a special rheumatism department by physicians trained in rheumatology and backed by interested and enthusiastic research-workers.

Welwyn Garden City.

F. WRIGLEY.

#### HOSPITAL MANAGEMENT COMMITTEES

SIR,—In two articles in your issue of April 24, reference was made to the danger of creating a third tier in the structure of hospital administration. As you point out, this risk will arise where a management committee has a comparatively large group of hospitals to administer and may have to delegate some of the day-to-day management to house committees. But a third tier might develop in other regions from an entirely different cause—namely, the gap between regional board and management committee.

In many provincial cities and towns recognised locally as hospital centres but not as regional hospital board centres, there are several large hospitals and numerous smaller institutions. The larger hospitals may have their own management committees, while others will be grouped under separate committees with the result that there may be four or five management committees to administer the hospitals in a city and the surrounding district. If the hospital services of such a group are to be coördinated there will have to be consultation between the various committees. There does not seem to be any provision for such consultation, and the lack of coördinating and planning machinery at a local level leaves a space in which may sprout another unwanted "tier of officialdom." All hospital services are to be planned and coördinated at regional level. Regional boards are responsible for very large areas, and their members come from towns as far as 100 miles apart; can they be expected to possess detailed local knowledge of each area in the region, or will their only advisers be the representatives (and there may be only one) of each town or area? The advice on local matters of local committees should obviously be available.

Complete separation between function and management will produce a sense of frustration at the management—i.e., local—level. To confine them to matters of management is to invite "administration for administration's sake." There are advantages as well as dangers in the proposed large groups of the South-East Metropolitan region which your correspondent criticises as potential minor regional boards. They at least will have the stimulus of group planning. Also, how much simpler to appoint one strong progressive committee than to find suitable members for five or more committees.

It should be possible to make some provision for consultation and liaison between management committees in one locality without setting up another administrative tier, for the powers of such a coördinating committee would be advisory, not executive.

Nottingham.

WILLIAM MORTON.

## Parliament

### FROM THE PRESS GALLERY

#### The Dental Service

In the House of Commons on May 3 Sir HUGH LUCAS-TOOTH moved a prayer to annul the draft regulations for the dental service to be set up under the National Health Service Act. Two main issues had arisen, he said, between the Minister and the dentists—clinical freedom and whether remuneration should be by fixed fees or by grants-in-aid. The regulations provided for the establishment of a 'board' to which dentists not practising at health centres would have to submit estimates. There were 12,000 practising dentists and if each submitted 2 cases a day 150,000 cases a week would require approval. Sir Hugh also thought that the list of treatments which could be undertaken without prior approval should be extended.

Sir WAVELL WAKEFIELD said that the dental profession protested strongly about the way in which the discussions at the Ministry had been carried out. They felt there had been discourtesy—

Here Mr. BEVAN interjected:

This is the second or third time that the representatives of some part of the medical profession have made that statement. If it is repeated I will publish a verbatim report of the exchanges between me and the medical profession. . . . All these conversations are confidential, and I am quite helpless when a stupid statement like that is made.

Continuing, Sir WAVELL WAKEFIELD said it was wrong that members of the profession should be asked to sign up when they had not the remotest idea how they were to be paid.

Mr. JOHN BAIRD admitted the great mass of the dentists did not want to commit themselves until they knew what remuneration they were to get, but to say they opposed the scheme was nonsense. There had been no plebiscite and no democratic method of judging the views of the dentists. If they were to have a National Health Service they must have a Dental Estimates Board to adjudicate between patients and dentists and the Government and the dentists. One of the advantages of the National Health scheme was to provide a balanced scale of fees, for which the profession had been fighting for a generation.

Mr. C. J. EDWARDS, parliamentary secretary to the Ministry of Health, declared that the department did not want to interfere any more than was necessary between a dentist and his patient, but the service was to be paid for mainly out of taxation, and the State therefore had some interest in the cost and the standard of service. Under these regulations dentists would be able to carry out more work without prior approval than was possible under present N.H.I. arrangements where approval was given by a lay body, the approved society. Now approval would be given by the Dental Estimates Board, which was predominantly professional. The Ministry thought that a decision on an estimate could reasonably be expected within a week of its receipt.

Under the regulations, Mr. Edwards ended, they had done their best to preserve clinical freedom and yet to protect the patient and to safeguard the State. There would be a good deal to discuss on the question of remuneration; but he was satisfied that these regulations, following closely proposals made by the profession at one time or another, represented the best they could do. The motion was rejected by 147 votes to 45.

#### QUESTION TIME

##### Assistants in the National Health Service

Mr. H. W. BOWDEN asked the Minister of Health if under his regulation a doctor now employed as an assistant might on July 5 commence a separate practice from his principal, providing patients wished to be placed on his panel and the district was not considered to be over-doctored, or whether he must commence outside of the area in which he was now practising as an assistant doctor.

Mr. ANEURN BEVAN replied: With the agreement of the Medical Practices Committee, an assistant may, on or after

1. *Lancet*, May 1, p. 696.



July 5, practise as a principal in any area under the National Health Service, but the agreement of the committee would not relieve him from any restrictions imposed by any personal legal agreement previously entered into with his principal.

#### The Doctor's Wife

Sir WALDRON SMITHERS asked the Minister if he had studied details which had been sent him about the position of doctors' wives under the Health Act; and if he would make a statement. Mr. BEVAN replied: As I have told those concerned, I think there is a tendency to overestimate the effect of the new service upon the position of doctors' wives. In any case I do not believe that they on reflection would wish to deprive the rest of the community of the benefits of the scheme by postponing the appointed day.

Major E. A. H. LEGGE-BOURKE: Does the Minister realise that doctors' wives who have no domestic help may find that the new health service will bear hardly upon them? If so, will he take action with the Minister of Labour to try to ease the domestic situation?—Mr. BEVAN: If it is found that extra work is thrown on doctors' wives, and that they find it burdensome, we shall consider what help we can give in the provision of domestic service. But I would remind the House that there are other wives with onerous burdens as well as doctors' wives.

#### The Right to Criticise

Mr. R. H. TURTON asked the Minister whether the statement made by the vice-chairman of the Bradford health executive council on April 7 to the effect that 33% of the prescriptions of sight-testing opticians were wrong was made with his approval; and whether he would stop his officers uttering derogatory remarks against opticians.—Mr. BEVAN replied: These must have been personal views. Nor is he one of my officers. He was appointed by the executive council themselves from among those of their members who were nominated by the local medical committee.—Mr. TURTON: Is the Minister aware that some officials working under the aegis of his department have come to believe that abuse of the professional man is the privilege of the Ministry? Will he make it clear that the privilege is not extended to them?—Mr. BEVAN: I have given an undertaking to the medical profession that both the administrative and professional aspects of the Act are free for criticism by anybody concerned, and I ought not to be asked whether I agree with what they say.

Mr. GEORGE HOUSE: Is the Minister aware that the estimate of 33% error is far too modest, in that there are thousands of young persons whose eyesight would be strengthened by exercises rather than by wholesale prescriptions by opticians for the use of glasses?—Mr. BEVAN: I am not going to add to my now dwindling anxieties by making any clinical comments.

#### Pension Rights of Leukæmia Cases

Mr. E. G. WILLIS asked the Minister of Pensions whether, in view of the decisions given in favour of the appellant by the High Court and by the Court of Session in leukæmia cases, he would consider accepting all these cases as eligible for awards under the Royal Warrant.—Mr. GEORGE BUCHANAN replied: A further case of leukæmia has recently been heard by the High Court and I think it advisable to await this judgment—which is expected shortly—before considering this matter further. I regret the delay that has occurred in dealing with this type of case, but my medical advisers have been unable to give me the certificate necessary to enable me to grant entitlement to pension.

Mr. WILLIS: In view of the apparently most unsatisfactory medical knowledge concerning this disease, will the Minister look into the matter again?—Mr. BUCHANAN: I have done everything possible, but the medical people hold very strong views. With the warrant as it is I am afraid that I can do nothing.

#### Sulphone Drugs in the Treatment of Leprosy

Mr. THOMAS REID asked the Secretary of State for the Colonies what progress had been made in the cure of leprosy in the Colonies by the use of sulphone drugs or otherwise.—Mr. D. R. REES-WILLIAMS replied: Much experimental work has been done in Africa and British Guiana with encouraging results. In West Africa a well-known leprologist from India is now planning larger-scale experiments on the effects of sulphone drugs, and similar researches are projected in East Africa. A preliminary report from British Guiana describes the trials made with 'Sulphetrone' as sufficiently promising to warrant further investigation.

## Obituary

### ARTHUR HENRY BURGESS

M.B., M.SC. MANC., LL.D., F.R.C.S., HON. F.A.C.S.

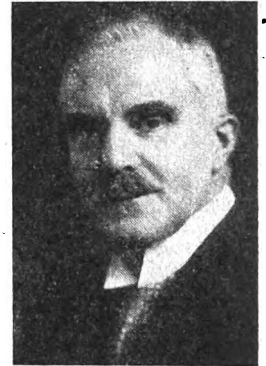
Mr. A. H. Burgess, emeritus professor of surgery in the University of Manchester and consulting surgeon to the Manchester Royal Infirmary, died on May 6 at Edinburgh where he was attending the meeting of the Association of Surgeons.

Born at Stretford in 1874, the son of John Henry Burgess, a Manchester merchant, he worked in a shipping firm before entering Owens College. In 1895 he took his M.B. in physiology and in the following year his M.B. with first-class honours. As a student he had been awarded many scholarships and exhibitions, and on qualification he was appointed house-surgeon at the Royal Infirmary. After holding other resident posts at the Crumpsall Hospital and the Manchester Children's Hospital, he returned there as resident surgical officer in 1899, the year in which he obtained the F.R.C.S. He held this post till 1901 when he entered consulting surgical practice. Soon afterwards he was appointed to the staffs of the Crumpsall Hospital and the Children's Hospital, and in 1905 to the staff of the Royal Infirmary itself. During the 1914-18 war he served as surgeon to the officers hospital of the 2nd Western General Hospital, and later he was in charge of a general hospital in Mesopotamia. He was also a member of the staff of the Christie Cancer Hospital. After several years as lecturer in clinical surgery at the University of Manchester he was appointed to the chair in 1921.

Burgess had thus received his medical education and (apart from his war service) spent all his working life in Manchester. He testified to his pride in being "untainted with metropolitanism" when in 1941 he described his Hunterian oration to the Royal College of Surgeons as a "provincial's day out" and chose as his subject the life and work of Charles White of Manchester. But though he was an unrepentant Mancunian his reputation was known further afield. When he was president of the British Medical Association in 1929 the Mayo brothers came from America to attend the meeting. On his visit to Canada the following year, to install his successor in this office, the degree of LL.D. was conferred on him by the University of Manitoba. He also visited Chicago in 1931 to deliver the J. B. Murphy oration to the American College of Surgeons. Meanwhile in 1925 he had been elected to the council of his own college at the head of the poll, and in 1934 he became for two years a vice-president. In 1933 he presided over the Association of Surgeons.

One of the first surgeons to dress himself completely in sterile clothing, Burgess's interest in all modern development of his craft was exemplified by his B.M.A. presidential address in 1929 when he spoke on the Debt of Surgery to the Ancillary Sciences and by his Bradshaw lecture in 1933 on electrosurgery.

"To those who knew Burgess in his time as resident surgical officer at the old infirmary," writes E. D. T., "it was clear that he was destined to go far in the practice of surgery. To a good physique, tireless energy, and a striking presence was added a dominant personality somewhat heightened by a tendency to brusqueness of manner. The times, too, were propitious. His teacher and pattern was Collier, who saw clearly the future developments of abdominal surgery, and on his untimely death Burgess stepped at once into his place and practice. Always a superb craftsman, he soon built up a huge practice which took him far and wide in the North-West. But despite the great demands on his time his hospital work and teaching never flagged, and he was unfailingly regular both in ward rounds and



U. W. Schmidt, Manchester

set lectures. His teaching leaned to the textbook type with careful exactness and attention to detail.

"His hospitality was proverbial, and in this he was greatly helped by his wife who, as a former Infirmary nurse, shared his interests. He felt her loss in 1941 keenly, but his deep love of music and his work for the E.M.S. as a consultant in surgery did something to soften the blow. Although he had been out of practice for some years his absorption in surgery held to the end—he was always ready to discuss modern trends round a table at the Union Club.

"Burgess was a great figure in the Manchester medical school, and his work lives after him, for many of the house-surgeons whom he trained have taken high rank in surgery and several today are important and valued teachers of the school."

Burgess was a deputy lieutenant of Lancashire and a member of the council of the Manchester College of Music. He leaves four sons and a daughter.

#### ERNEST MAURICE FRAENKEL

M.D. Breslau & Milan, L.M.S.S.A.

Dr. E. M. Fraenkel, consulting allergist to the London County Council hospitals service, died on April 20 at the age of 61.

Born in Silesia, he took his medical degree at Breslau in 1910. During the 1914-18 war he served as a pathologist with the German army, and was chiefly concerned with research on gas-gangrene, Weil's disease, and influenza. Later he held a chair of medicine in the University of Berlin and he was also on the staffs of the Charité and Rudolf Virchow Hospitals. In 1933 Fraenkel came to England. At first he worked at the Westminster Hospital on cancer and tuberculosis, for though his interests were mainly in the field of allergy he was attracted like so many others to the genesis of cancer.

In 1937 he went as a voluntary worker to the Southern Group Laboratory at Park Hospital, where he carried out research on the relationship of moulds to asthma and showed that a good proportion of asthma cases were caused by moulds such as penicillium, aspergillus, and mucor. He investigated thoroughly a large number of these cases in the L.C.C. hospitals, and in 1945 he was appointed consulting allergist to the council. Shortly before his death he had begun to study the cause of the eosinophilia in asthma cases. His published work also included papers on social aspects of allergy and on air purification.

Dr. Fraenkel leaves a widow and one daughter.

### Appointments

CHARRETT, M. A., M.R.C.S., D.P.H.: deputy M.O.H., Weston-super-Mare.  
 ESHER, F. J. S., M.B. Birm., D.P.M.: regional psychiatrist, Sheffield.  
 FOWLER, A. W., M.B. Lond., F.R.C.S.: orthopaedic registrar, Royal Halifax Infirmary.  
 GREEN, H. F., M.A., M.B. Camb., D.P.H.: asst. county M.O.H., and M.O.H. for Malvern and Upton-on-Severn, Worcs.  
 MORTIMER, P. L. F., M.B. Lond., D.A.: anaesthetics registrar and tutor in anaesthetics, Bristol Royal Hospital.  
 RADLEY SMITH, E. J., M.S. Lond., F.R.C.S.: neurosurgeon, Royal National Throat, Nose, and Ear Hospital, London.  
 STRINGER, P. R., F.R.C.S.: asst. surgeon, West Herts Hospital, Hemel Hempstead.  
 TIERNEY, R. B. H., M.B.: asst. pathologist, St. Bartholomew's Hospital, Rochester.  
 WHALLEY, G. H., M.B., B.HYG. Durh., D.P.H.: deputy M.O.H., Newcastle-on-Tyne.

#### Hospital for Sick Children, Great Ormond Street, W.C.1:

MATTHEWS, J. D. H., M.B. N.Z., M.R.C.P., D.C.H.: house-physician.  
 ROBERTS, T. B. L., M.R.C.S., D.A.: first asst. anaesthetist.  
 ROCHFORD, J. P., B.M. Oxf.: house-surgeon.  
 WILLIAMSON, D. A. J., M.D. Lond., M.R.C.P., D.C.H.: resident medical registrar and pathologist.

#### Colonial Service:

BARTON, J. J., M.B. Glasg., D.T.M.: temporary M.O., Nigeria.  
 CHARLES, L. J., M.B. Edin., D.T.M. & H.: M.O.H., Jamaica.  
 DOWDESWELL, R. M., M.D. Camb.: asst. director of laboratory services, Kenya.  
 EDDY, L. G., M.B. Aberd., D.T.M. & H.: director of medical services, British Guiana.  
 GOODMAN, LEONARD, F.R.C.S.E.: M.O., Gold Coast.  
 HOPWOOD, B. E. C., M.R.C.S.: M.O., Uganda.  
 LOWSON, J. M. A., M.A., M.B. St. And., M.R.C.P.E., D.T.M. & H.: superscale M.O., grade A, Federation of Malaya.  
 MACGREGOR, G. W. R., L.R.C.P.E.: M.O., Gold Coast.  
 PITT, C. S., M.R.C.S.: M.O., Kenya.  
 WATSON, A. R., M.B. Edin.: M.O., Kenya.  
 YOUNG, G. C., M.R.C.S., D.P.M.: specialist (allienist), Uganda.

## Notes and News

### A NEW HOME FOR OLD PEOPLE

THE many visitors who attended the opening of the Old People's Hostel at 31, Eton Avenue, London, N.W.3, on May 3, found themselves in a large airy house with fine rooms, a noble oak staircase, delicate paint-work, and comfortable furniture. Some of the big bedrooms easily took four beds, each with its coloured bedspread and eiderdown (and the colours varied); but there were also two-bedded and single rooms for those who preferred them. The well-equipped kitchen opened by a serving hatch into the dining-room, set with small tables; and behind the kitchen were the spacious scullery, larder, and boiler-room, and a sitting-room for the domestic staff. The house is rich in bathrooms; and one specially put in, on the ground floor, contains a sitz bath for the convenience of rheumatic old people. Some of the other baths have specially low sides and flat bottoms, and are almost as easy to step into as a punt securely beached.

This house, set in a sizeable garden, represents the first project undertaken by the Hampstead Old People's Housing Trust; but it is not to be the last. Councillor Mrs. D. M. Page, the hon. secretary, mentioned the work of the old people's welfare committee set up by the Hampstead Council of Social Service in May, 1946. They started several clubs for old people, which are doing good work; but they early decided that housing was the most important need. The trust was formed in February, 1947; and this first hostel opened its doors on March 1, 1948, to 8 residents. It can take 26 in all, and is now almost full; and the residents, she said, are making it a real home.

So far there has been no public appeal for funds. Councillor Miss M. Rackstraw, chairman of the committee of management, told how the Nuffield Trust had given £3500, and the Lord Mayor's Air-Raid Distress Fund £2500, while the Hampstead Borough Council had made a loan of £5000, of which £500 was interest-free. The cost of maintaining a resident is £2 10s. a week, and some are able to pay the full sum; others pay part and receive some help—but not, she said, enough—from the Assistance Board. The trust need many more shareholders not only to bridge this deficit but to enable them to undertake much more work of this kind. She mentioned a project to provide hostels for semi-independent old people, who would like to bring their own furniture and have a room each: they would look after themselves, though the hostel would provide a solid midday meal.

Mr. Fred Messer, M.P., who declared the hostel open, remarked that the problems of old age are not solved by giving money. We must give the sort of service which allows old people to live a normal life. The ordered routine of an institution where the inmates have no chance to express their personality is a negation of life. His long experience of social legislation, he said, has shown him that even the best-devised Act lacks something: there is always something unforeseen, always the need for something extra-statutory; and that is where voluntary service comes in. The success of the trust's work will depend on the relationship among those running the hostel and those living in it. The residents must be able to feel that this is as much their home as their own house or flat would be.

This is certainly the right recipe for success, and to all appearances the Hampstead Housing Trust have followed it closely. The residents, who were of course present at the meeting, had the tranquil air of good hostesses who saw their party going well.

### A COMBINED PATHOLOGY SERVICE

SINCE last November a new pathology service has been developed for Portsmouth and the Isle of Wight. As a result of bombing, laboratory space is scarce, and a combined service is therefore being provided to serve the needs of five hospitals in Portsmouth (St. Mary's, St. James, the Isolation Hospital, the Royal Hospital, and the Eye and Ear Hospital) and the Royal Isle of Wight County Hospital, Ryde, which already undertakes the pathology of the Frank James Hospital, Cowes, the Shanklin Cottage Hospital, and St. Mary's Hospital, Newport, as well as the City of Portsmouth and the Isle of Wight County Council. The Ministry of Health has approved a plan to convert a building in the Portsmouth Isolation Hospital into a pathology department, and this will also house a bacteriologist who will undertake the bacteriological work primarily of the public-health service but also of

the hospitals in the group. Hitherto each hospital laboratory has done the bulk of its own pathological work, but in addition each will now be responsible for a specialty: thus the Royal Portsmouth will do the morbid-histology work of the whole group, while the Isle of Wight County Hospital will be responsible for the biochemistry. Eventually the main department will be responsible for all the more difficult pathology, though the hospitals in the group are maintaining their laboratories and thus ensuring day-to-day liaison with patients and doctors. This makes it possible to economise equipment.

The scheme, which came into full action on April 1, is the result of much planning, in which Dr. E. M. Darmady and Dr. J. A. D. Radcliffe, pathologists to hospitals in the group, have taken a leading part. Dr. Darmady has been appointed senior pathologist and adviser to the new service, Dr. Radcliffe pathologist, and Dr. S. C. Dobson assistant pathologist. A second assistant pathologist and a biochemist, as well as extra technicians, are to be appointed.

#### MEDICAL ART SOCIETY

THE annual exhibition of the society will be held at Walker's Galleries, 118, New Bond Street, London, W.1, from Wednesday, May 19, to Tuesday, June 1. The annual dinner will be held at 7 P.M. on Tuesday, May 18, at Kettner's Restaurant, Romilly Street, W.1, and will be followed by the private view of the exhibition at the galleries.

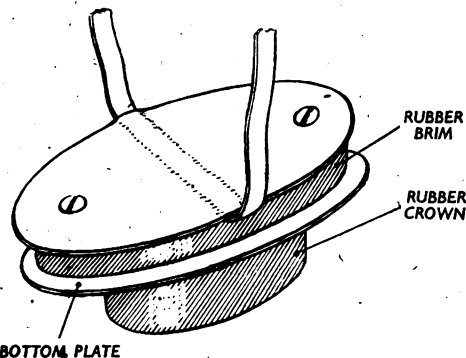
Membership of the society is open to all doctors interested in the visual arts, and non-exhibiting members will be welcome at the dinner, at the private view, and at the monthly instructional classes held during the winter. Further information may be had from Dr. Henry Wilson, the hon. secretary, 142, Harley Street, W.1.

#### ACCIDENTS IN INDUSTRY

ADDRESSING the Royal Society of Medicine's section of epidemiology and State medicine at Oxford on April 23, Mr. W. T. Russell, D.Sc., said that up to 1921 statistics were collected on an industrial rather than on an occupational basis, with the result that the dangers of high-risk operations might be masked by grouping with low-risk operations in the same industry. Occupational morbidity figures tended to be influenced by selective recruitment on account of aptitude or fitness for particular types of work; but these figures were generally more reliable than those of mortality, since unfit and older people tended to seek light work and the last occupation only was recorded on the death certificate. Industrial hazards remained severe: in England and Wales during 1946 there were 230,000 recorded accidents with 826 fatalities. A recent survey had shown that accident-rates were high at ages under 20 years and continued to decline even after 50.

#### CUSHION HEEL FOR WALKING-IRONS

A PATIENT in the Military Hospital, Wheatley, Oxford, has designed a simple device to relieve one of the discomforts of walking with a plaster-encased leg, by removing the continual jarring of the iron heel on the ground. He made two oval metal plates (see figure) about 3 in.  $\times$  1½ in., bored with



corresponding holes to take fixing bolts. A hole 1¼ in. in diameter was bored centrally in one plate. Next, a block of rubber 1½ in. thick was cut into the shape of a top-hat. The "crown" was passed through the large hole in one plate, and the "brim" and metal heel of the walking-iron were sandwiched between the two plates. The bolts were then tightened, and the result was a comfortable cushion heel.

#### ADDITIONS TO THE POISONS LIST

UNDER the Poisons List (Amendment) Order, 1948, and the Poisons (Amendment) Rules, 1948, which came into operation on May 10, the following substances are added to part I of the poisons list and to the first schedule to the poisons rules:

'Amidone' (*dl*-2-dimethylamino-4:4-diphenyl-heptane-5-one) and its salts.

Carbachol.

Curare, alkaloids and bases. (This is in substitution for 'Curarine,' which is now deleted from the list and the schedule.)

'Metopon' (methylhydromorphinone) and its salts.

Sodium monofluoracetate.

Allylisopropylacetylurea is deleted from the seventh schedule and added to the fourth schedule to the poisons rules. This substance thus becomes subject to the same conditions with respect to supply and labelling as the barbiturates and sulphonamides.

A new rule (14A) has been made which replaces, with some extension of the list of substances affected, the Poisons Colouring Rules, 1936, which are now revoked. Under this new rule the requirement as to colouring is widened to include arsenical poisons intended for the treatment of any infestation; lead-arsenate paste and powder must now be coloured, and the colouring must be of such a nature as to be apparent whether the poison is dry, or wet, or in solution.

#### University of Oxford

On April 29 the following degrees were conferred:

D.M.—D. L. Davies, K. C. Royes.\*

B.M.—G. F. M. Carnegie,\* G. O. Jelly.\*

\* In absence.

#### University of Cambridge

On May 1 the following degrees were conferred:

M.D.—Frank Ridehalgh, R. D. Teare, Neville Southwell, E. J. Crisp.

M.B., B.Chir.—J. L. Hansell, F. S. Mellows,\* J. C. R. Payne,\* A. I. D. Prentice, R. A. Ryan, R. S. Smylie.\*

M.B.—R. D. Ewing.\*

\* By proxy.

During April the title of the degree of M.D. was conferred on Helen E. Dimsdale.

#### University of Glasgow

On April 24 the degree of M.D. was conferred on J. Hood, J. S. K. Boyd, and R. R. Gordon.

#### Royal College of Physicians of Edinburgh

At a meeting held on May 4, with Dr. W. D. D. Small, the president, in the chair, the following took their seats as fellows:

H. A. Raeburn (North Berwick), G. M. Wilson (Edinburgh), D. N. Dobbie (Bromley, Kent).

The following were elected fellows:

E. H. Duff (Selkirk), E. K. Morris (Edinburgh).

The following were elected members:

R. C. L. Batchelor, C. W. Clayson, J. F. Galpine, R. J. McGill, J. E. A. David, Yu Hans Tang, Victor Solomon, G. W. Senter, W. S. Thomson, jun., M. R. Clarke, C. G. Williams, K. J. Dunlop, T. B. Binns, A. V. Bird, R. J. G. Sinclair, J. O. Forfar, Morris Medale, D. K. Stevenson, J. R. Fountain, I. D. B. Bottomley, Don Hilson, Kemble Greenwood, B. B. Manna, F. L. Ritchie, Hyman Shrand, Beatrice M. Wilson.

The Lister fellowship for original research carried out in the laboratory of the college was awarded to Dr. T. W. Lees.

#### Return to Practice

The Central Medical War Committee announces that the following have resumed civilian practice:

Mr. D. ASTLEY SANFORD, F.R.C.S., 7, Thornhill Terrace, Sunderland, Co. Durham.

Dr. E. IDRIS JONES, M.R.C.P., 44, Harley Street, London, W.1.

#### The Clerical, Medical, and General

The Clerical, Medical, and General Life Assurance Society had another successful year in 1947.

Sir Francis Smith, the chairman, reports new life-assurance business amounting, after deduction of re-assurances, to £4,341,723—an increase of 23% over the corresponding figure for the previous year. As the result of the year's transactions, the life-assurance fund rose by £537,881 to £16,974,837; the capital redemption fund by £699,524 to £1,222,065; and the combined assurance funds by £1,237,405 to £18,196,902. The net interest yield on the life-assurance fund, after deduction of income-tax, rose by 4s. 4d. to £3 12s. 8d.%. The total assets at the end of the year stood at £19,187,429—an increase of £1,579,528.

**Royal College of Obstetricians and Gynaecologists**

The following have obtained the diploma in obstetrics :

E. P. Abson, J. D. Andrew, Muriel S. Alexander, D. L. Arnold, P. B. Atkinson, Peter Barron, J. P. Bennett, Bimla Bhattacharya, D. T. Binns, D. K. Black, D. H. Blakey, Winifrid M. Bond, S. C. Bose, George Bridge, Jean M. Briscoe, Joyce E. Brooks, H. J. S. Brown, R. A. Bush, John Campbell, J. P. Carlile, D. L. Carmichael, R. S. Jasebant, G. B. Chamberlain, J. E. Clay, Katharine M. D. Colman, Canet S. Conn, Mary C. E. Constantine, R. W. Cowie, John Crabb, Evelyn M. Crawford, D. H. Crook, John Crossley, F. A. L. Da Cunha, M. H. Dale, J. M. B. Donaldson, James Dougall, G. H. P. Drake, C. D. Drew, Elisabeth A. Ede, Lamia El-Badri, C. C. Evill, M. B. Fox, W. D. Frew, Harry Friend, C. O. Fung-Kee-Fung, Elizabeth Gilbertson, D. W. Huw Griffiths, Lillian M. Griffiths, Philip Haden, Ruth A. Haes, Costa Halmamandras, Lakshmi Haldar, G. J. Hall, J. R. A. Hall, Constance I. Ham, D. M. Hare, S. H. Heard, John Henderson, Thomas Hepburn, Nancy Heron, J. D. S. Hethcote, W. S. Hill, E. H. Hillyard, S. R. Hing, Robert Hodgkinson, Flora M. Hogg, H. J. Holloway, T. A. Hope, P. W. Hopper, Henry Hutchison, E. W. Hanganthleke, R. A. Iranl, P. F. C. Jackson, Ruby M. Jackson, A. W. Kelly, G. L. Kennedy, H. H. Kirk, Heinz Korte, P. B. Lacy, Rupert Laverty, R. G. Law, Daisy J. Lee, R. E. Leighton, Jean B. Lindsay, R. H. Little, M. O. Luck, J. W. F. Lumsden, J. D. M. Lytle, Isabel M. Macrae, Margaret D. R. McDougle, F. J. McEnroy, A. A. McKirdy, A. D. MacLean, J. H. MacLoughlin, I. F. MacMath, Florence H. Macmichael, T. M. McNie, Donald MacVicar, J. J. Marlow, Barbara D. S. Marshall, R. H. Martin, Queenie I. E. May, Eva G. Maughan, J. I. Miller, Norah C. Miller, C. M. Meyer, A. P. B. Mitchell, A. B. Mitra, Godfrey Morgan, Nathan Moss, Edith R. Munro, Alexina M. H. Myles, A. O. Nichols, W. P. O'Keefe, Mary D. Owen, J. L. Park, R. B. Parker, Jean M. Paterson, Noel J. Pease, J. H. Pendered, G. W. Pinder, J. H. M. Pinkerton, H. P. Purder, S. H. M. Price, Joseph Priceman, T. M. Pritchard, J. P. C. Purdon, Eleanor R. Raistrick, Angel M. Rondle-Short, J. C. A. Renshaw, Philip Rhodes, Nancy M. E. Robertshaw, Ruth M. Roocke, T. M. Roulston, W. R. Russell, K. D. Salzmann, Bernard Sandler, H. I. Schmlig, J. W. F. Scringeur, T. O. Scudamore, E. H. Seward, Elsie M. Sibthorpe, S. A. Siddiki, Aaron Simons, E. M. Slattery, A. L. H. Smith, Z. H. Y. Sobani, D. B. Spanton, Agnes M. Stark, Vera E. Stimpson, R. A. Thatchoer, C. J. Thornberry, R. W. H. Tincker, Sterling Tomlinson, G. E. E. Usher-Somers, Corris Venables, F. L. A. Vernon, F. G. H. Watson, Margaret S. White, G. F. J. Williams, J. A. Williams, Marion Williams, T. A. Yates, E. J. Young-Thompson, E. G. Zacks, Oscar Zammit.

**Royal Faculty of Physicians and Surgeons of Glasgow**

At a meeting of the faculty on May 3, with Prof. G. B. Fleming, the president, in the chair, the following were admitted to the fellowship :

Karel Blum, John Macwhannell Cook, Khalique-UI-Wahhab Hazratji (qua physicians), Anthony James Leonsins, Eiohn Lynn Forsyth McConnachie, Isidore Robins (qua surgeons).

**Production of Radioactive Isotopes**

The Medical Research Council has already received small quantities of radiophosphorus and radio-iodine produced at the Atomic Energy Research Establishment, Harwell. Here a second and larger pile is expected to be in operation within the next few months.

**Summer School in Health Education**

The Central Council for Health Education is holding its annual summer school this year at High Leigh, Hoddesdon, Hertfordshire, from Aug. 11 to 25. The speakers will include Prof. Samson Wright, Dr. Robert Cruickshank, Prof. J. M. Mackintosh, and Sir Alexander Fleming, F.R.S. Further details may be had from the medical adviser of the council, at Tavistock House, Tavistock Square, London, W.C.1.

**Tribute to Sir Leonard Parsons**

On May 5 the faculty of medicine of the University of Birmingham held a dinner in honour of Sir Leonard Parsons's election to the fellowship of the Royal Society. Mr. Raymond Priestley, D.Sc., vice-chancellor, was in the chair. Sir Norman Haworth, vice-principal of the university and a vice-president of the Royal Society, in proposing Sir Leonard's health, recalled how closely he and Sir Leonard had been associated, especially in work on ascorbic acid and deficiency diseases. He went on to describe the origin and growth of the society, emphasising particularly the part played by physicians. Dr. Stanley Barnes, a previous dean of the faculty, and Prof. A. P. Thomson, M.D., also spoke, paying tribute to Sir Leonard's character and to the contribution which he had made to the problems of child health as well as to the part he had played in recent developments in the faculty.

*Corrigendum.*—The name of the Schorstein research fellowship in medical science was misspelt in an advertisement in our issue of April 24. It is tenable in any medical department or institute at Oxford.

**Diary of the Week**

MAY 16 TO 22

**Tuesday, 18th**

ROYAL COLLEGE OF PHYSICIANS, Pall Mall East, S.W.1  
5 P.M. Prof. A. A. Moncrieff: Tuberculosis in Children.  
INSTITUTE OF DERMATOLOGY, 5, Lisle Street, W.C.2  
5 P.M. Dr. H. J. Wallace: Erythematous-squamous Eruptions.  
UNIVERSITY OF DUBLIN  
4.30 P.M. (School of Physic, Trinity College.) Sir Paul Fildes, F.R.S.: Planned Chemotherapy. (John Mallet Purser lecture.)

**Wednesday, 19th**

HARVEIAN SOCIETY OF LONDON  
8.15 P.M. (26, Portland Place, W.1.) Prof. Melville Arnott: Clinical Research in Medical Education.

**Thursday, 20th**

ROYAL COLLEGE OF PHYSICIANS  
5 P.M. Dr. Macdonald Critchley: Parietal Lobe and its Syndromes.  
BRITISH INSTITUTE OF RADIOLOGY, 32, Welbeck Street, W.1  
8.30 P.M. Mr. J. N. Young, Dr. J. E. Bannen: Abdominal Emergencies and Use of the Direct Radiograph.  
HONYMAN GILLESPIE LECTURE  
4.30 P.M. (Edinburgh Royal Infirmary.) Prof. Ian Aird: Genesis of Chronic Peptic Ulcer.

**Friday, 21st**

ROYAL COLLEGE OF PHYSICIANS  
5 P.M. Professor Moncrieff: Digestive Disorders in Infancy.  
ROYAL COLLEGE OF OBSTETRICIANS AND GYNAECOLOGISTS, 58, Queen Anne Street, W.1  
5 P.M. Prof. J. M. Munro Kerr: Contracted Pelvis. (William Meredith Fletcher Shaw lecture.)  
FACULTY OF RADIOLOGISTS  
2.15 P.M. (Royal College of Surgeons, Lincoln's Inn Fields, W.C.2.) Sir Stanford Cade: Natural History of Malignant Disease. (Skinner lecture.)  
WEST LONDON MEDICO-CHIRURGICAL SOCIETY  
7.30 P.M. (South Kensington Hotel, 41, Queen's Gate Terrace, S.W.7.) Colour films of plastic surgery from Prof. Pomfret Kilner's clinic.  
TUBERCULOSIS ASSOCIATION  
2.30 P.M. (Queen Elizabeth Hospital, Birmingham.) Prof. W. Melville Arnott, Dr. A. G. Whitfield, Dr. G. H. Armitage: Clinical Estimation of Cardiorespiratory Function.  
4.30 P.M. Dr. Francis Jarman: Clinical Significance of Bronchial Lesions in Pulmonary Tuberculosis.

**Saturday, 22nd**

TUBERCULOSIS ASSOCIATION  
9.30 A.M. (University, Edmund Street.) Dr. A. Clark Penman: Primary Tuberculosis in the Adult.  
10.30 A.M. Dr. J. E. Geddes, Mr. A. L. d'Abreu: Selection of Cases for Thoracoplasty.  
NOON. Mr. Geoffrey Bateman: Colour film on Bronchial Tumours (made by Dr. Paul H. Hollinger, of Chicago).

**Births, Marriages, and Deaths****BIRTHS**

AGATE.—On May 3, in London, the wife of Dr. John Agate—a daughter.  
BROOKS.—On April 25, at East Bridgford, Notts, the wife of Dr. Geoffrey Brooks—a daughter.  
CRUICKSHANK.—On May 3, the wife of Lieut.-Colonel J. D. Cruickshank, R.A.M.C.—a daughter.  
FRANKLIN.—On May 7, in London, the wife of Dr. A. W. Franklin—a son.  
HUTCHISON.—On May 4, in Glasgow, the wife of Dr. Stewart Hutchison—a daughter.  
KELLY.—On May 1, the wife of Dr. Derek Kelly—a daughter.  
MOLE.—On May 3, at Oxford, the wife of Dr. R. H. Mole—a son.  
MURLEY.—On May 6, the wife of Mr. R. S. Murley, F.R.C.S.—a son.  
ROBINSON.—On May 2, the wife of Dr. G. A. Robinson—a daughter.  
STRINGER.—On May 1, at Woodford, Essex, the wife of Mr. Paul Stringer, F.R.C.S.—a son.  
SWAN.—On May 5, at Worthing, the wife of Dr. J. F. Swan—a daughter.  
WATSON.—On April 28, the wife of Dr. G. I. Watson—a son.

**MARRIAGES**

BACK—TRAVERS.—On May 1, at Yelling, Hunts, Eric Hatfield Back, M.R.C.P., to Christina Travers.  
CONNELL—WHIFFEN.—On May 1, in London, Michael Charles Connell, M.B., to Edith Marcia Whiffen.  
GILBEY—AULT.—On May 3, in Johannesburg, Arthur Lionel Gilbey, F.R.C.S.E., to Joan Mary Ault.  
GILLIES—CANNY.—On May 6, in Glasgow, Hunter Gillies, M.D., to Isabelle Canny.

**DEATHS**

BURGESS.—On May 6, in Edinburgh, Arthur Henry Burgess, M.Sc., M.B. Manc., F.R.C.S., aged 74.  
CHAPMAN.—On May 7, at Cardross, Katharine Mary Chapman, L.R.C.P.E.  
DAVIES.—On May 2, at Carmarthen, Gwylon Davies, M.C., M.R.C.S.  
RAISON.—On May 8, in Birmingham, Cyril Alban Raison, M.B. Birm., F.R.C.S., aged 58.  
SCOONES.—On May 5, at Hythe, Kent, Harold Edward Scoones, M.R.C.S.

# THE LANCET

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## INFECTIONS OF THE FINGERS AND HAND

A REPORT FROM THE HAND CLINIC OF UNIVERSITY  
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ACUTE infections of the fingers and hand have a twofold importance and interest—to industry because of the waste of working-hours which they cause, and to doctors because of the hopes of easier and better treatment raised by penicillin. Since this is largely an industrial problem, treatment is usefully judged on the economic basis of working-days lost. It should be the aim of all concerned to reduce the disability period to a minimum, and this cannot be done merely by providing adequate facilities for treatment. Though none will question the benefits conferred by penicillin, there is some doubt about its best application to infections of the hand, and the reported increase in penicillin-resistant strains of staphylococci<sup>1</sup> suggests that the benefits may be transient. It therefore becomes the more important to reassert the validity of principles of treatment established before the discovery of penicillin.

Our purpose is, first, to describe a conservative method of treating hand infections which without penicillin gave better than average results with less than average trouble; secondly, to describe experimental uses of penicillin in conjunction with this treatment, and to make some tentative conclusions about its value; and, thirdly, to report the results of the combined treatment in the trial period. No account is given of the results obtained without penicillin before the period under review, and the present series is regarded as a minimal achievement, which better appreciation of the use of penicillin will certainly improve. It should be emphasised that the conservative treatment was worked out before penicillin was introduced, and so far its principles have not been modified. The additional safeguard of penicillin may allow modification—e.g., in relaxation of the insistence on immobilisation.

The clinical material for this study comprises a large series of cases treated in a special clinic for infections of the hand. Originally started in 1933 as a weekly advisory clinic to which cases were referred by the casualty officers, it revealed the unsatisfactory state of treatment and was therefore later developed into a clinic held thrice weekly and controlling all outpatient treatment of hand infections. With the conservative methods of treatment developed in the clinic, and with the collaboration of casualty officers, it was possible with a thrice-weekly clinic to maintain an adequate control of treatment. This control, however, was no longer adequate when the clinic patients began to receive systemic penicillin treatment, but it was not until May, 1947, that the number of clinics was increased to six, four being held in the morning and two in the evening. Another reason for increasing the number of clinics was the need to see patients after return to work if a reliable record of disability time was to be made. The evening sessions are arranged particularly for patients who have resumed work.

Though the conservative treatment has been in use in the clinic for about ten years, the results reported are for the period from January, 1946, to June, 1947, when penicillin was also being used. In this period 591 new cases were seen, of which 395 are adequately recorded for analysis. The wastage is mainly due to patients taking their discharge between clinics when they think they need no further treatment. A report on the work of the advisory phase of the clinic for the years 1934–36 was published by Devenish,<sup>2</sup> and occasional reference will be made to the results obtained in that period before the present methods of treatment had been adopted. In the three years covered by the first report 388 cases were seen at the clinic, since when the number of patients attending has been more than trebled.

Since the treatment at present practised in the clinic in some respects runs counter to orthodox teaching, a brief discussion of its principles and their pathological basis precedes the more detailed description of their application in the groups into which the infections are classified.

## PATHOLOGY

Most infections of the hand are caused by the *Staphylococcus aureus*, which by its powerful exotoxin causes death of tissue and thrombosis of vessels. In the natural evolution of infection dead tissue is separated by suppuration and rejected as slough or sequestrum. It is important to recognise that death of tissue is an early feature of staphylococcal infections, and that patients seldom seek treatment before it has occurred. Sloughing is conspicuous in the fibro-fatty subcutaneous tissue of the front of the hand and fingers, not because it is commoner than elsewhere but because the fibrous tissue is denser and more abundant and yields slowly to liquefaction. Thrombosis of vascular trunks is not common, but is the probable cause of massive necrosis of the terminal phalanx, and of the rare cases of gangrene of the whole or part of a digit. It is often stated that vascular accidents are due to arterial obstruction by the tension in an inflammatory focus, particularly in the pulp; and based on this speculation, for which there is no adequate evidence, treatment by early incision has been advocated and widely practised to the detriment of many fingers. The observation that an early pulp infection is vigorously pulsatile ill accords with a theory which postulates pressure ischaemia as the cause of necrosis. It is our conviction that death of tissue depends on bacterial toxins and not on anatomical peculiarities of the part. The only anatomical compartments of the hand that determine patterns of infection are the joints and synovial sheaths. The so-called closed space of the pulp has no significance, and infections of the deep palmar spaces have not been seen in the clinic. These unorthodox views are based on careful inspection of numerous abscesses in a bloodless field, and do not imply denial of anatomical facts.

The anatomical feature of the hand which is of cardinal importance in infections is the skin, which is specially adapted to the function of the limb. It is thicker than elsewhere, and on the front is almost fixed to the deep fascia by fibrous bands and septa, some of which connect with periosteum. Adaptation occurs further in response to use, but this is mainly an increase in the thickness of the horny layer. The thickening of the horny layer protects the hand from trauma but adversely affects its reaction to infection. The hard inelastic skin does not yield to inflammatory swelling, and when suppuration takes place, does not allow pus to escape.

## Suppuration

Suppuration takes place at three levels in relation to the skin: in the epidermis, in the dermis, and in the subcutaneous tissue (fig. 1).

1. Barber, M. *Brit. med. J.* 1947, II, 863.2. Devenish, E. A. *Arch. Surg., Chicago*, 1938, 37, 726.

An abscess in the epidermis is usually referred to as a subcuticular abscess and may be confined to that layer—e.g., an infected traumatic blister. Often, however, subcuticular pus is found in association with deeper abscesses, and the connexion between superficial and deep components may be narrow, when the term "collar-stud" abscess is sometimes applied (fig. 1d). The thick horny layer is not easily penetrated spontaneously by pus and may be widely stripped when a deep abscess extends to the epidermis.

Abscesses in the dermis can be recognised sometimes on careful inspection of the floor of a subcuticular abscess, and it is important to recognise in such a case that there is no subcutaneous abscess. A subcutaneous abscess may be confined to the subcutaneous tissue, but, having a natural tendency to escape to the surface, it is often accompanied by a subcuticular extension. In a favourable case unroofing of a subcuticular abscess is all that is needed for the completion of natural resolution.

Without an appreciation of the distinction between the three levels of abscess formation there can be no logical surgical treatment. Misconceptions are common, particularly in regard to paronychia.

Paronychia is primarily a subcuticular or intra-cutaneous infection of the nail fold, and abscess formation deep to these levels is rare. The abscess may lie on the deep or superficial aspect of the nail fold and may extend round the fold or under the nail but not into the subcutaneous tissue (fig. 2).

The most important subcutaneous lesion is infection of the pulp of the finger. This does not differ in essentials from other subcutaneous infections, but sloughing is of special importance because it impairs the delicate tactile function of the pulp. Bone necrosis is a well-known complication of this infection, and its prevention has been the aim of many misdirected surgical endeavours. The soft tissue of the pulp is at least as important as the bone, but many attempts to save the bone by early surgery have ruined the function of the pulp. That bone necrosis is due to pressure ischaemia has never been proved, and in no other situation is surgery advised for subcutaneous cellulitis before pus has formed. Another type of infection that may involve bone is the apical abscess. This occurs at the tip of the finger under the free edge of the nail and extends dorsally under the nail and ventrally into the pulp so that the roof of the abscess is formed partly by nail and partly by skin. It is very close to the end of the terminal phalanx and may infect it.

Subcutaneous abscesses in other parts of the hand may have special significance because of the proximity of joints or of tendons, but it is very rare for these to be involved spontaneously by a primary subcutaneous infection. Complications involving tendon sheaths and joints result either from inoculation by the initial trauma or by injudicious surgery. It should be remembered that apparently trivial wounds may have involved other structures than skin and that infection may be disastrous. This is particularly true of wounds over the knuckles, which may involve the joints. Carbuncles occur mainly on the hairy back of the hand and sometimes involve the extensor tendons. Except for this complication they do not differ from carbuncles elsewhere, and they share the general tendency of this type of infection to resolve slowly.

The common subcutaneous lesion of the hand is the web abscess, which may present on the front or back or both and may involve more than one web. It arises in many ways but is often the sequel of an infected blister or crack at the base of the finger. There seems to be little doubt that this abscess is sometimes mistaken for one in the deep palmar spaces, and the incisions usually advised for the latter are adequate for web abscesses. Complex palmar abscesses are sometimes seen in which a subcutaneous component is continuous with one deep

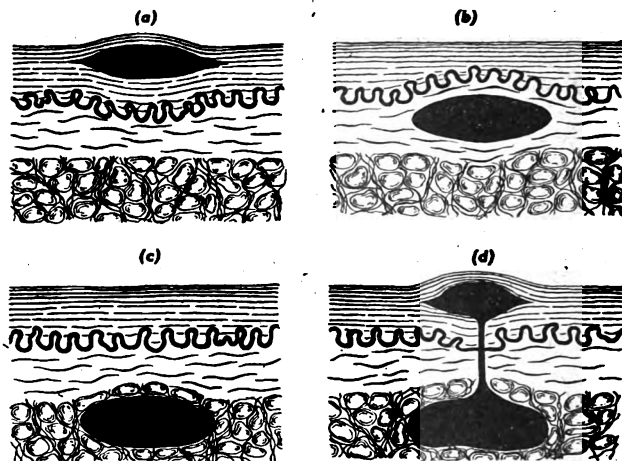


Fig. 1.—Abscesses in relation to skin: (a) subcuticular; (b) intra-cutaneous; (c) subcutaneous; (d) subcutaneous with subcuticular extension ("collar-stud abscess").

to the palmar aponeurosis, which may also extend deeper between the flexor tendons. No extension of a web abscess along a lumbrical tendon has been observed, and the relation of such an abscess to the lumbrical tendon and digital nerves varies. Digital nerves may lie in the wall of any abscess that arises near them and are sometimes displaced. The possibility of displacement is important in the siting of incisions.

#### Edema

Edema is an important feature of all hand infections. It is always greater on the back than on the front, irrespective of the site of infection, because the dorsal skin is looser. It has often misled the inexperienced to a wrong diagnosis of the site of infection. Edema is an inevitable sequel of infection, but its extent can and should be controlled. Excessive swelling calls for postural treatment, for the oedema, being inflammatory in origin, is rich in protein and, if allowed to persist, will contribute to stiffness of the hand.

The 591 infections of the hand and fingers are classified as follows:

Lesion	No. of cases
Paronychia .. .. .	154 (26%)
Pulp abscess .. .. .	107 (18%)
Apical abscess .. .. .	26 (4%)
Web abscess .. .. .	23 (4%)
Cellulitis .. .. .	43 (7%)
Subcuticular abscess .. .. .	45 (8%)
Intra-cutaneous abscess .. .. .	15 (2.5%)
Subcutaneous abscess .. .. .	81 (14%)
Carbuncle .. .. .	34 (6%)
Erysipeloid .. .. .	9 (1.5%)
Miscellaneous .. .. .	54 (9%)
Total .. .. .	591

Only the first four types of lesion are localised to definite sites, the others being classified on a pathological basis.

#### PRINCIPLES OF TREATMENT

The two principles that have been followed are to rest the hand during the diffuse phase of the infection and to postpone incision until a localised abscess has formed.

*Splinting.*—Various forms of splint have been tried, but all have been abandoned in favour of volar or dorsal plaster-of-paris slabs, from the upper part of the forearm to the finger-tips, holding the wrist slightly extended and the fingers slightly flexed at all joints. The finger-tips are fixed by turning the end of the plaster over them. The thumb requires a modification of the simple slab and it too is splinted in flexion. Attempts to splint single fingers, leaving the others free, have been given up, since they are seldom satisfactory, and it is better that the patient should refrain from using the hand at all during the period of rest. The splinted hand is supported



in a sling; but, if there is much œdema, the patient is instructed to elevate it at home, or he may be admitted for a day or two for continuous suspension. This treatment alone has been effective in controlling cellulitis and localising infection. Pain too is usually relieved, but some patients require anodynes at this stage. Splinting is continued until the lesion is judged to be healing. There may sometimes be rapid recovery without suppuration, but usually an abscess forms, and splinting is then continued at least until the first dressing after opening of the abscess. Treated by rest alone most abscesses come to the surface as subcuticular lesions, and in that event simple unroofing of the subcuticular component may give adequate drainage. To wait for this in every case wastes time and subjects the patient to unnecessary pain but will probably do no other harm.

**Incision.**—The usual practice in the clinic is to incise when an abscess and its exact site are diagnosed. As long as there is doubt about the presence of pus, treatment by rest is continued. If an abscess is diagnosed at the first attendance and there is little cellulitis round it, it is opened at once. In the presence of cellulitis the diagnosis of pus and its site may be difficult, but after a period of rest, with the resulting diminution of swelling and tension, it becomes easier. If the pus is subcuticular, its site is obvious; but the deep extension of a subcuticular abscess is not necessarily at its centre. If pus is subcutaneous, its site may be recognised by localised tenderness and a slight blue discoloration of the overlying skin.

**Operation** is done under local anaesthesia, and a bloodless field is essential. Procaine 2% without adrenaline is used to block the nerves at the base of the finger for digital lesions, and at the wrist for lesions of the hand. Application of the tourniquet before the nerve block is made increases its efficiency. For the fingers rubber tubing stretched round the base and clipped with artery forceps is adequate, and for more proximal lesions a sphygmomanometer cuff on the arm. Before application of the tourniquet the limb is elevated, but no attempt is made to empty it completely of blood. No complications attributable to the use of local anaesthesia or tourniquets have been seen. The incision is made over the point where the abscess is nearest the surface, so that the minimum of uninfected tissue is opened, and in a direction parallel with Langer's lines. There is no place for standardised incisions for opening these abscesses. Pus having been located, the incision may be enlarged according to the extent of the abscess as determined by probing. Pus and loose slough are mopped out of the cavity, which is then carefully inspected for possible complications such as bare bone or tendon sheath.

If there is a subcuticular component of a deep abscess it is unroofed and mopped out. The track to the deep part can then be identified in the floor and its extent determined by probing. If necessary the opening into the deep part can be enlarged, and this is usually advisable if it contains slough which will not be easily discharged through a small hole. In the fingers no drains are used; for palmar abscesses a greased calico strip may be laid between the wound edges to prevent premature healing. Drainage of the wound may be helped by paring back the edges of the skin so that it has the shape of a narrow diamond. This is very useful for the horny palmar skin which swells and obliterates the opening when sodden by discharge. The wound is dressed with dry gauze only, and splinting is continued until œdema and cellulitis have subsided.

**After-treatment** consists of dressings, at first daily, but less frequently when healing has started. Sloughs often come away adherent to the dressing but may be removed from the wound if this can be done painlessly. So far we have refrained from excising slough, but this is referred to again below. Fomentations and hot soaks are never used, but occasionally tulle gras is used to dress sensitive wounds such as a recently exposed nail bed.

### Penicillin

As already stated, during the period under review the treatment outlined above has been combined in various ways with penicillin therapy, both systemic and local.

Of its value in a few well-defined groups, such as tendon-sheath infection, there can be no doubt, though opinions may differ about the best method of administration. But for the great variety of infections seen in the clinic, with patients presenting themselves at any time from a day to weeks after onset, it is not yet possible to offer any precise definition of its scope. From the trials made in the clinic some tentative conclusions are offered, but these are based largely on impressions, and statistical evidence is not yet available.

**Systemic penicillin** has been used on the same indication as rest and immobilisation—i.e., to control spread of infection. The most serious cases have always been admitted for treatment, and still are, and for these three-hourly injections of 30,000 units have been the usual method of administration. For the systemic treatment of outpatients several methods have been tried, but the only one that has been found effective, as judged by clinical effects, is a daily injection of 300,000 units in arachis oil-beeswax suspension. It was not found practicable to give outpatients treatment more often than twice daily, and no aqueous solutions were found adequate at this interval.\* It is concluded that the patients treated with methods other than the oil-beeswax suspension did not have the full benefit of penicillin.

Cases treated early with penicillin and rest may resolve completely, as they sometimes did with rest alone. If treatment is started later, when tissue death has already occurred and suppuration has probably started, spread of infection is still controlled, but the fate of the local lesion is less certain. In a few cases there has been observed, after the resolution of swelling, a persistent local tenderness with a slight discoloration of the overlying skin, taking about a fortnight to resolve. This has been interpreted as absorption of slough in a lesion which has been sterilised with penicillin, and the process does not seem to be any quicker than surgical drainage.

\* Recently twice daily injections of 0.5 mega unit in saline have been found effective.

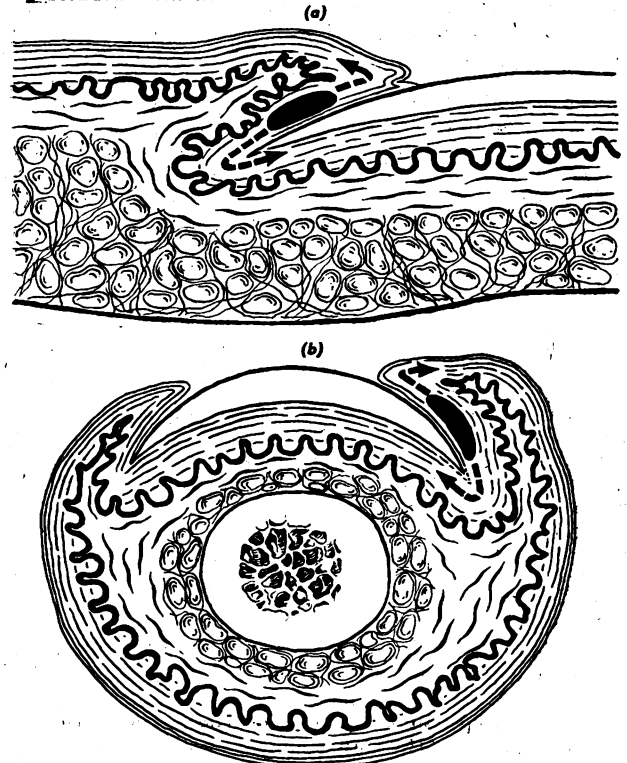


Fig. 2.—Paronychia: (a) sagittal section; (b) transverse section, showing usual sites of origin and directions of spread.

Systemic penicillin produces a rapid improvement in the signs of infection, and usually relieves pain; hence there is every encouragement to postpone drainage. It is worth remembering, however, that penicillin also eliminates the dangers of spreading the infection previously associated with early operation. This is well illustrated in the treatment of tenosynovitis, in which early operation used to be followed by cellulitis round the incisions for opening the sheath, but with penicillin can be undertaken without risk of this complication. Unless, therefore, there is hope of spontaneous resolution, it appears more logical to accelerate rather than to delay surgical treatment. In the previous report from this clinic<sup>2</sup> it was stated: "Operative treatment short of total extirpation of the affected area cannot benefit a patient with an acute infection during the period of spread." With penicillin cover it may be possible to perform an early excision of a focus of infection in the hand. This idea is encouraged by experience in the clinic of what may be called salvage operations on open suppurating joints in the fingers. Some of these have been admitted, and under systemic penicillin the skin has been sutured after the removal of slough and sequestrum. Healing has been obtained, with some recovery of function.

Systemic penicillin has not been tried as an alternative to splinting and rest, but only in conjunction with it. Probably some relaxation of this rule could be safely made, but only if there is reasonable certainty that the infecting organism is penicillin-sensitive. The need to control swelling remains, and is still an indication for rest and elevation.

Local application of penicillin has been on trial longer than systemic because of the very small quantities required. The preparation now used in the clinic is a mixture of penicillin and lactose with a potency of 2000 units per g. The advantage of this is that the solubility of lactose is a safeguard against caking of the powder in the wound. Its most valuable application, in our experience, has been in the control of infection of the phalanges, to which further reference is made below. Three tentative conclusions on the local use of penicillin are offered:

(1) If bare bone is found in the floor of an abscess, local penicillin will prevent serious osteitis and will accelerate healing, usually without sequestration.

(2) As a local application to a subcuticular abscess, including paronychia, penicillin accelerates healing.

(3) If slough is adherent in a drained subcutaneous abscess, local penicillin will delay its separation.

Though lactose is easily soluble it will cake if there is not enough exudate to dissolve it, and the powder must therefore be used sparingly in subcuticular lesions and paronychia.

#### DETAILS OF TREATMENT AND RESULTS

The results are summarised in the accompanying table, in which the length of treatment is added to the time elapsed from onset of symptoms to attendance at the clinic, this being the nearest approximation obtainable to the disability period. In the preparation of this table there has been no selection of cases, except for the rejection of those patients who took their discharge before healing was complete, and about whom data are therefore inadequate. Most of these cases are the less serious infections, with rapid resolution. Any attempt to shorten the disability period must take into account the reluctance of patients to stop work and seek treatment for what appears at the onset to be a trivial complaint. The difference made in the results by early attendance is shown in the last two columns of the table. It will be noted in the discussion that most of the serious complications have arisen in cases that have had operations performed before attendance at the clinic. These

have not been separated in the table, which therefore shows the results obtained in all cases referred to the clinic by the application of its methods at all stages of the disease.

#### Paronychia

The treatment of paronychia is drainage of the subcuticular abscess in the nail fold. The abscess usually starts on the deep aspect of the nail fold, and is at first hidden by the normal adhesion of the nail fold to the nail. It may spread to the superficial aspect of the nail fold, or under the nail, but remains subcuticular (fig. 2). Only rarely is subcutaneous pus found associated with paronychia. Occasionally patients are seen before localisation has taken place, but this is uncommon. Once pus has formed, the operation must be proceeded with, without delay, because the abscess cavity will rapidly increase in size, and is likely to spread under the nail. A floating nail can occur within four days of the onset of the infection, and a "run-around" in twenty-four hours.

The first and essential step in the operation, which is done under ring block and tourniquet, is to separate the nail fold from the nail by blunt dissection. It is important to continue this separation right across the base of the nail and up the side of the nail, so that the nail base may be adequately exposed. The stripping must be continued until the base of the nail is reached. While this is being done the abscess will usually be opened, and this may be all that is required to give adequate drainage. The base of the nail must be examined for a subungual collection of pus. The dead nail overlying an abscess is dull in appearance and has lost its normal resilience when touched with forceps. It is cut away with scissors, but no attempt is made to remove nail still adherent to the nail bed.

The only dressing needed is dry gauze. Penicillin-lactose powder may be dusted into the sulcus between the nail and the nail fold, but only a little should be used, because if it

#### RESULTS OF TREATMENT

(Time given in days; number of cases treated in parentheses.)

Lesion	Onset to attendance (all cases)	Length of treatment all cases *	Onset of disease to end of treatment (approximate duration of disability)	Length of treatment in uncomplicated cases	Length of treatment in complicated cases	Length of treatment early cases (0-4 days)	Length of treatment late cases (4+ days)
Acute paronychia ..	4.4 (75)	9.8 (83)	14.7 (75)	8.5 (62)	16.7 (21)	12 (45)	11.7 (31)
Chronic paronychia	37.2 (13)	14.7 (15)	47.4 (13)	..	..	..	..
Pulp abscess ..	5.8 (75)	16.8 (80)	23.7 (71)	11.8 (61)	33.5 (19)	14.1 (30)	18 (45)
Apical abscess ..	5.3 (20)	6.4 (22)	11.6 (20)	..	..	6.2 (10)	5.8 (10)
Web abscess ..	4.8 (12)	13.6 (13)	18.4 (12)	..	..	13.3 (7)	15.6 (5)
Cellulitis ..	5.1 (32)	9.7 (32)	14.8 (32)	5.6 (23)	20.3 (9)	7.5 (17)	12.3 (15)
Subcuticular abscess	3.5 (24)	5.7 (29)	9.1 (24)	..	..	5 (20)	9 (4)
Intracutaneous abscess	2.6 (11)	5.8 (11)	8.1 (11)	..	..	7 (9)	3 (2)
Subcutaneous abscess	5.5 (55)	14.0 (61)	19.5 (55)	10.6 (52)	33.5 (9)	12.0 (29)	17.0 (26)
Carbuncle ...	4.5 (22)	32.2 (22)	36.7 (22)	12.8 (16)	83.8 (6)	18.6 (9)	41.6 (13)
Erysipeloid ..	5.4 (7)	7.5 (8)	12.9 (7)	..	..	7.4 (4)	7.7 (3)

\* The total of cases in this column is 376. The remaining 19 cases to make up the total of 395 are in the miscellaneous group which has not been analysed in this table. The difference in totals between columns 1 and 2 is due to lack of information about date of onset in a few cases.

becomes dry and caked it will delay healing. A splint is applied until the first dressing, when it can usually be discarded.

The traditional operation of raising the whole nail fold after lateral incision through its whole thickness, followed by excision of the nail, is condemned as unsound for the following reasons: (1) the infection is in the subcuticular layer and, if the uninfected subcutaneous tissues of the nail fold are opened up, cellulitis results, whereupon sloughing and retraction of the nail fold cause unnecessary deformity; and (2) undamaged nail is removed, which may lead to sloughing of the nail bed and subsequent deformity of the nail when it regenerates.

Iselin<sup>3</sup> describes septic arthritis and osteomyelitis as common complications of paronychia. In this series these complications have not been seen, possibly because the traditional incisions through the whole thickness of the nail fold are not used.

Chronic paronychia is seen at the clinic fairly often. These cases may or may not give a history of a previous operation, and may present in three different ways: (1) a chronically infected nail fold, with a sodden swollen edge from under which exudes thin pus, usually in patients who have been treated with hot fomentations or antiseptic dressings for a long time without relief and have never been subjected to operation; (2) a small button of granulation tissue appears from under the nail fold usually in patients who have been operated on previously, but in whom the wound has never ceased to discharge; and (3) a chronically discharging sinus in the skin over the nail bed proximal to the nail fold in patients who have been subjected to the lateral full-thickness incision, and in whom the wound has otherwise healed. Nearly all these chronic infections are due either to retained pieces of dead nail with subungual pus (the most common cause) or to a retained foreign body. The treatment consists of raising the nail fold as described above and removing the dead nail or foreign body. This is followed by rapid healing. During the period under review no fungus infections of the nail have been seen.

To distinguish acute from chronic cases it was decided to classify as chronic all those patients who had not attended for treatment until after fourteen days from the onset of symptoms. There were 83 cases of acute paronychia and 15 cases of chronic paronychia. The results of treatment are shown in the table. The average disability period of all acute cases was 14.7 days. In Devenish's<sup>2</sup> report 74 out of 84 uncomplicated cases of paronychia had a disability period of more than fourteen days. The incidence of complicated cases in the acute group is high—21 out of 83 (25%). Delay in healing was attributed to the following causes:

- Unsatisfactory first operation (9 cases—7 elsewhere and 2 in the clinic).
- Delay in first attendance (4 cases).
- Granuloma formation (2 cases—1 before and 1 after attendance at the clinic).
- Periostitis (1 case).
- Adherent slough (2 cases).
- Cellulitis (1 case).
- Spread to pulp (1 case).
- Cellulitis at site of penicillin injection in arm (1 case).

Thus in 12 of the 21 cases in which there was delay in healing the cause was outside the control of the clinic.

### Pulp Infections

In early cases of pulp infection the condition is a cellulitis in which abscess formation has not taken place. The pulp is red, swollen, pulsating, and diffusely tender. Cases of cellulitis of the pulp are treated by immobilisation and, if there is evidence of spread of the infection, systemic penicillin.

As abscess formation occurs in conservatively treated cases the physical signs change. Swelling, tension, and

pulsation diminish, and the skin colour changes from bright red to a more dusky shade. The abscess forms a localised tender swelling in the pulp, which if not obvious from inspection may be taken to underlie the area of maximal tenderness. Once an abscess has formed, drainage should be established; but a delay in operation to determine the site of the pus more accurately is less dangerous than premature incision.

Operation is performed under ring block anaesthesia and tourniquet. A small incision is made over the area of maximal tenderness, and through this incision the extent of the abscess cavity is determined with a probe. The incision is then extended to give adequate access, but it must not be extended into healthy tissue. Slough and pus are evacuated, and the floor of the abscess cavity is examined with a probe for evidence of bone involvement. Adherent slough is not excised but is left to separate spontaneously.

The incision is not made in any set direction but is made directly over the abscess so that the minimum of healthy tissue is incised. No drains are inserted, but to ensure adequate drainage the edges of the skin incision are excised to give a small diamond-shaped wound. Central incisions of the pulp have not been followed by tender scars or impairment of sensation. Extensive incisions, with division of the septa of the pulp, are never used and are regarded as unnecessary and damaging to the pulp.

Late cases in which subcuticular abscess has formed can sometimes be treated without anaesthesia. The subcuticular abscess is unroofed, and through the sinus in its floor the slough in the pulp is lifted out, if it is loose. If, however, the sinus is too small to allow this, the finger is anaesthetised, and the sinus enlarged to allow removal of the slough, or to improve drainage when it is still adherent.

Patients attending the clinic for the first time who have suffered premature incision are treated conservatively until the cellulitis has resolved, and then any abscess that forms is drained.

The results of treatment are shown in the table. The average disability period in all cases was 23.7 days. In Devenish's<sup>2</sup> series the average disability period for all cases was about four weeks. Complications arose in 19 of our cases, nearly 24% of the group. The complications observed were:

- Infection of the terminal phalanx (16 cases).
- Formation of subungual abscess (2 cases).
- Delayed separation of slough (1 case).

There were no cases of persistent tender scar.

### Infection of Terminal Phalanx

Of the 16 cases of infection of the terminal phalanx 8 were classified as periostitis, showing bare solid bone clinically, with no sequestration (none of these cases was radiographed); 6 cases were classified as osteitis, of which 4 were confirmed by radiography, 3 of them showing rarefaction and 1 showing sequestration also. In this last and in 2 other cases of osteitis sequestration of fragments of the terminal phalanx occurred. Finally, 2 cases were listed as classical osteomyelitis with necrosis and sequestration of the shaft of the terminal phalanx. Thus, of the 16 cases in which bone infection was diagnosed, sequestration took place in 5 only. Both cases of osteomyelitis, and 2 cases each of osteitis and periostitis, had been operated on before attendance at the clinic. In only 1 case treated from the start by the clinic was there sequestration.

The cases with periostitis were treated by local application of penicillin-lactose powder and plaster immobilisation. Cases of osteitis were similarly treated and observed to determine whether sequestra would be discharged or not. In the true cases of osteomyelitis sequestrectomy was performed and the cavity was packed with penicillin-lactose powder.

The 8 cases of periostitis had an average length of treatment of 21.4 days, with full function obtained in 6 cases but bad pulp scarring in 2. The 6 cases with osteitis took 39.7 days on the average to heal, and 5 of these obtained full function, but 1 has poor flexion of

3. Iselin, M. *Surgery of the Hand*. London, 1940.

the terminal joint. The 2 cases of osteomyelitis had an average duration of treatment of 68.5 days, and both show scarring, loss of pulp substance, and a stiff terminal joint. In Devenish's<sup>2</sup> report 12 out of 72 pulp infections had necrosis of the terminal phalanx, with an average disability period of nine weeks, the shortest being six weeks.

#### *Apical Abscess (Subungual)*

The treatment consists of the removal of the devitalised skin and the distal part of the nail overlying the abscess cavity to provide free drainage. The floor of the abscess is examined carefully with a probe to determine whether the terminal phalanx is bare. The wound is then dusted with penicillin-lactose powder and dressed with dry gauze. The results of treatment of 22 cases of apical abscess are shown in the table. In this group there were no cases of osteomyelitis, and no painful scars resulted. Both of these complications are held to be common by Iselin.<sup>5</sup> In only 1 case was the phalanx found to be denuded of periosteum at operation, and in this case the wound healed in two days.

#### *Web Abscess*

Web infections are treated by immobilisation and chemotherapy until the infection is localised and the cellulitis has resolved. Many cases show considerable oedema of the dorsum of the hand and fingers, which spreads into the interdigital cleft and obscures the lesion. Such cases are better for a period of elevation of the limb, best secured by rest in bed, to reduce the oedema.

Abscess formation is associated with brawny induration in the interdigital cleft, which causes separation of the fingers. Subcuticular pus may be present and then serves as a guide to the site of the incision. If no subcuticular abscess is present, the site of maximal tenderness may be taken as a guide for the incision, which therefore varies according to the position of the abscess. If the abscess is pointing anteriorly at the base of the finger, a transverse incision parallel to the skin crease is made and continued back into the web as far as is necessary to provide adequate drainage. If the abscess is pointing on the dorsum of the web, the incision is made over this area in the interdigital cleft. Wherever the incision is made, great care is taken to incise the skin only; otherwise the digital nerve may be divided or the flexor tendon opened. A probe is passed into the abscess cavity to determine its extent, and the incision is prolonged to give adequate drainage. Slough and pus are mopped out, and sufficient skin is excised from the edge of the incision to prevent the edges of the wound from falling together. The insertion of a drain is unnecessary.

The average disability period in this group was 18.4 days. No complications arose, and in all cases there was full recovery of movement. In 1 case the scar was indurated and in 1 it was tender.

#### *Cellulitis*

Mild cases have been treated by immobilisation, and the more severe cases by immobilisation combined with systemic penicillin. Complete resolution followed in 5 cases after one injection of penicillin. Early incision is dangerous in this condition, because it is likely to spread the infection. On the other hand, there is some evidence that those cases treated with penicillin which went on to abscess formation took longer to heal as a result of delayed separation of the slough. Of the 32 cases in this group complications arose in 9 as follows:

Subcuticular abscess with slow separation of slough (4 cases).

Spreading cellulitis as a result of operation elsewhere (3 cases).

Interphalangeal joint effusion (2 cases).

In all cases except 1, in which there had been a joint effusion, there was complete recovery of function. In

this case there was a slight limitation of extension of the proximal interphalangeal joint.

#### *Subcuticular Abscess*

The treatment of this condition is simple, and cure rapidly follows. No anaesthesia is required. The cuticle overlying the abscess is carefully excised with a pair of fine-pointed scissors. The pus is mopped away, and after the floor of the abscess has been examined for the presence of a deep extension, the raw area is dusted with penicillin-lactose powder and dressed with dry gauze. Care must be taken to ensure that all the raised cuticle is removed, lest a small tag should remain and become adherent, leading to the formation of another abscess.

The results of treatment in 29 cases are shown in the table. No complications arose, and all but one patient had a complete functional recovery. In this patient there was a slight residual stiffness of the finger when she was last seen.

#### *Intracutaneous Abscess*

These abscesses, which are always small, may occur anywhere on the hand but are commoner on the fingers than elsewhere. The treatment consists in excising the epidermis which forms the roof of the abscess and mopping out the slough and pus from the cavity. The floor of the abscess cavity must be carefully examined to make sure that there is no track leading to a subcutaneous abscess.

There were 15 cases in this group with an average duration of disability of 8.1 days. All cases recovered full function, and there were no complications.

#### *Subcutaneous Abscess*

The treatment of this condition follows the principle already described and does not require to be varied according to the site of the abscess. The results of treatment are shown in the table, from which it will be seen that delay in attendance is responsible for a considerable prolongation of the period of treatment. Premature incision before adequate localisation is dangerous. In 6 cases a previous operation had been performed before localisation had taken place, and in these cases the average duration of treatment was 19.2 days, compared with 14 days for the whole group. The average disability period was 19.5 days. The complications met with in this group were as follows:

Abscess spreading to the web (1 case).

Osteomyelitis (1 case).

Associated subungual abscess (1 case).

Persistent sinus (1 case).

Multiple foreign bodies (1 case).

Premature incision (2 cases).

Cut extensor tendon (1 case).

Slow separation of slough (1 case).

Of the 61 cases 56 healed with full function and a soft supple scar. Of the remaining 5, 2 showed slight residual stiffness, 2 had atrophy of skin and subcutaneous tissue and stiffness of interphalangeal joint, and 1 had a scar which was tender when knocked but not on palpation.

#### *Carbuncle*

The initial treatment is immobilisation until the carbuncle is localised. Systemic penicillin is administered if the cellulitis is extending. Subcuticular abscesses are unroofed as they form. After a variable time the slough separates and may then be removed. The resulting cavity is often of considerable size; but, once the slough is removed, healing is rapid, and skin grafting has not been necessary. As has already been mentioned, these cases tend to run a slow course, the average disability period being 36.7 days. The table again shows the effect on the disability period of delay in starting treatment.

Complications arose in this group in 6 cases, of which 4 were incised early elsewhere, 1 of them three times,

with the insertion of a through-and-through rubber drain; 2 of these cases developed osteomyelitis, and in 1 the end of the flexor profundus tendon sloughed. Of these 4 cases, 2 were left with stiff fingers, 1 case developed a web abscess, and 1 a thrombosis of the basilic vein. Among the uncomplicated cases all except one had a return of full function. This case, in a man aged 65, had a tender scar and limitation of flexion of all the joints of the finger.

#### *Erysipeloid*

Erysipeloid is an uncommon infection of the hand. There were 8 cases in this series, all confined to the fingers. In 5 cases there was a history of injury to the finger while handling raw fish. The lesion is characterised by swelling of the whole of the finger, and the skin is reddish-blue, tense, and shiny. In some cases there was an axillary lymphadenitis. The patient complained of stiffness and itching of the finger. Treatment consisted of immobilisation and the administration of penicillin or sulphonamides. Response to treatment was rapid, and in all cases there was complete restoration of function.

#### *Suppurative Tenosynovitis*

These cases have not been analysed in the table; they form part of the miscellaneous group previously mentioned; 3 cases were seen. In 1 case there was a history of previous trauma, and the other 2 patients had had operations elsewhere for septic fingers. Penicillin had masked the signs and symptoms in 1 case. In 2 cases a hæmolytic streptococcus was responsible, and the other was caused by *Staph. aureus*. The patients were admitted to hospital, systemic penicillin was started at once, and operation was performed shortly after admission. General anaesthesia was used in 2 cases, and a median nerve block for the third. In each case two incisions were made. The distal incision was transverse through the original route of infection; the proximal was also transverse in the palm just distal to the distal transverse crease, exposing the proximal cul-de-sac of the tendon sheath. Both ends of the sheath were opened, and a small diamond-shaped piece was excised to allow free drainage. In all 3 cases the tendons were thought to be viable. After operation the hand was immobilised with plaster and elevated. Systemic penicillin was continued for several days.

The average time from onset to attendance at the clinic was 3 days, and the average length of treatment 15 days. One patient attained full function, another had slight residual stiffness when last seen, and the third had a limitation of extension to 130° at the first interphalangeal joint, which was subsequently increased to 170° by excision of an adherent flexor sublimis tendon.

#### *Septic Arthritis*

This is also included in the miscellaneous group, 3 cases of septic arthritis of the interphalangeal joint being seen. These were treated with preoperative systemic penicillin in an attempt to sterilise the lesion, and subsequently the necrotic tissues were excised. In 1 case the joint cartilages were excised; in the other 2 they were preserved. In 2 of these cases the joint subsequently recovered limited and painless movement, but in the third case an ankylosis developed in a good functional position.

The remaining cases in the miscellaneous group do not call for any special comment.

#### SUMMARY

The principles and practice of the treatment of infections of the fingers and hand in a special clinic are described, and the results of eighteen months' work reported.

Acute infections of the skin and subcutaneous tissues of the fingers and hand are treated by immobilisation during the diffuse phase of infection.

Operation is delayed until pus is localised, and its sole function is the evacuation of pus and slough.

Paronychia is a subcuticular infection which can be adequately treated without sacrifice of healthy nail.

Pulp infections are treated by immobilisation until pus has formed. Incisions to relieve tension in the stage of cellulitis are condemned.

Penicillin is used systemically to control spread of infection and locally to accelerate healing. It is thought to delay separation of slough but to prevent spread of bone infection.

Causes of prolonged disability are delay in starting treatment and incisions in the stage of cellulitis.

## TISSUE FORMS OF A MALARIA PARASITE PLASMODIUM CYNOMOLGI

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With illustrations on plate

THE parasite *Plasmodium cynomolgi*, which causes malaria in monkeys, closely resembles *P. vivax*, the parasite which causes benign tertian malaria in man. The presence of developmental forms of *P. cynomolgi* in the liver of monkeys infected with sporozoites has been reported by Shortt and Garnham (1948), who kindly demonstrated their preparations to us. We confirm here the existence of such tissue forms and describe certain aspects of their biology and morphology. A preliminary note on this work has appeared elsewhere (Hawking 1948).

The history of previous investigations on this stage of the malaria parasite has already been described (Lancet 1948, Davey 1946).

Briefly, after the cycle in the blood had been described by Laveran, and that in the mosquito by Ross, Schaudinn (1902) reported that he had observed sporozoites of *P. vivax* actively penetrating red blood-cells. This seemed to complete our knowledge of the whole life-history of the malaria parasite, and his account was accepted almost universally.

However, about 1931 the question was reopened by James and others, who emphasised the great differences between infections induced by inoculation of infected blood and those induced by sporozoites. In the latter there is a minimum latent period of six days (*P. falciparum*) or eight days (*P. vivax*) during which the blood is not infective if subinoculated into new subjects, and the resultant infections cannot be prevented or eradicated with quinine. Accordingly James (1931) postulated that the sporozoite (or some form arising from it) passed into the tissues and underwent further development before invading the red blood-cells.

A few years later tissue (exo-erythrocytic) forms of avian malaria were demonstrated by Raffaele (1936), Kikuth and Mudrow (1937), and James and Tate (1938). In 1942 and 1943 the development of the sporozoites of bird malaria (*P. relictum* and *P. gallinaceum*) was elucidated by Huff and Coulston (publication delayed by censor till 1944), and by Reichenow and Mudrow (1943), who showed that in birds the sporozoites pass into the macrophages and similar reticulo-endothelial cells of the skin, spleen, and other organs, and spend three or more generations as exo-erythrocytic forms before invading the red blood-cells.

It was expected that the malaria parasites of man and of monkeys would develop along similar lines, but in spite of intensive search for this development in America, Britain, and India no success was obtained until Shortt and Garnham (1948) announced the finding of tissue forms in the liver.

TABLE I—RELATION BETWEEN TIME (AFTER INOCULATION OF SPOOROZOITES) OF WITHDRAWAL OF BLOOD AND ITS INFECTIVITY TO OTHER MONKEYS

Time (days + hr.)	Details of infection			Volume of blood transferred (ml.)	Results
	No. of infected mosquitoes	Site	Incubation period of donor monkey (days)		
0 + 2	48	I.D. under tourniquet	11	0.7	Positive after 22 days
2	300	I.V. and I.D.	(9)	20.0	Negative
5	40	I.V. and I.D.	(10)	15.0	Negative
7 + 1	320	Lung and muscle	10	1.0	Negative
7 + 2	14	Marrow	..	2.0	Negative
7 + 3	Washings from 40	I.V.	10	10.0	Negative
7 + 4	Washings from 120	I.V.	9 1/2	17.0	Negative
7 + 7	55	I.V.	18 given P.A.B.	1.0	Negative
7 + 9	140	Lung	13	14.0	Negative
7 + 15	1000	I.V.	(10 1/2)	20.0	Negative
7 + 21	6	I.V.	11	10.0	Negative (? latent infection)
7 + 23	120	I.V. and I.D.	(9)	10.0	Positive after 14 days
8 + 0	Washings from 120	I.V.	9	10.0	Negative
8 + 5	Washings from 300	I.V.	9	9.0	Positive after 17 days
9 (parasites present)	Washings from 300	..	9	8.0	Positive after 4 days

I.D. = intradermal; I.V. = intravenous; P.A.B. = p-aminobenzoic acid.

The present investigation was undertaken with *P. cynomolgi*, which produces in the rhesus monkey (*Macaca mulatta*) a benign infection consisting of a primary attack often followed by several relapses, usually ending in a spontaneous cure after about 6-8 months. Our strain was kindly supplied by Dr. F. Wolfson, of the School of Public Health, Johns Hopkins Medical School, Baltimore, and it is understood that the strain was originally obtained from the Central Research Institute of India, at Kasauli.

Sporozoites were obtained by feeding either *Anopheles quadrimaculatus* or *A. maculipennis* on a suitable monkey. Both these species were susceptible to infection, and in some batches almost all the mosquitoes became infected. In many experiments large numbers of infected salivary glands were injected in a very small volume of fluid. Though this technique, based on that described by Huff and Coulston (1944), did not in fact assist in the discovery of the parasites, it is described here because it may be useful for other purposes:

The wings, legs, and head of the mosquito were removed by one operator, and the body of the insect was placed on a slide near a small drop of saline; the next operator pulled out the salivary glands under a dissecting microscope and placed them in the saline; a third operator picked up the glands in a small bent capillary pipette and transferred them to a mixture of serum and Ringer's solution in a hollow slide. By this means the glands of over 100 mosquitoes could be collected in an hour. The glands were then sucked up (under a dissecting microscope) into the shaft of a large long short-bevelled needle (internal capacity 0.08 ml.) attached to a tuberculin syringe, and injected where required. Sections

have been stained with Giemsa, Maximow's hæmatoxylin-azure-eosin, hæmatoxylin and eosin, and Dobell's molybdate hæmatoxylin.

#### BIOLOGICAL INFORMATION

During this work various observations were made on the biological behaviour of malaria parasites during the first nine days after the injection of sporozoites.

#### Non-transmissibility of Tissue Forms

On three occasions the liver (together with other organs) was removed from monkeys which had received heavy doses of sporozoites 2 days, 5 days, or 7 days 15 hours earlier. In each experiment the liver was minced and a large volume of the suspension was injected intraperitoneally and subcutaneously into another monkey. None of these monkeys became infected, but histological examination later demonstrated the presence of parasites in the livers of the monkeys killed 5 days and 7 days 15 hours after the inoculation. Apparently parasites cannot successfully transfer themselves from one host cell to another during this stage of their development. Suspensions from the other organs of these three animals were also inoculated into a series of other monkeys, but none of them became infected.

In many other experiments heavy suspensions of sporozoites (usually contained in salivary glands) were injected into some site which was later excised, part of it being subinoculated intraperitoneally, intravenously, or subcutaneously into a fresh monkey. In this way examination was made of the spleen (six times, at 4 hours to 7 days), lymph-gland (five times, at 1 to 6 days), lung (four times, at 1 1/2 to 7 1/2 days), skin (four times, at 2 to 5 days), marrow (four times, at 5 hours to 7 days), muscle (three times, at 2 to 6 days), and cerebrum (once, at 7 1/2 days). In three experiments sporozoites were injected into the skin of one monkey at several places and after 1 or 2 days the pieces of skin were transplanted on to another monkey. No infection resulted from any of these experiments. This failure to transmit the infection by subinoculation of tissue—even when parasites were present, as in the liver—greatly hindered attempts to locate the parasites.

#### Period at which Blood becomes Infective

In many experiments blood was taken from a monkey at various periods after the inoculation of sporozoites and injected intravenously into another monkey to test its infectivity. A summary of these observations is given in table 1, where "Washings from 120" &c. means that 120 mosquitoes had been ground up in about 5 ml. of fluid and the supernatant part had been injected into another monkey (as the principal part of an experiment); the sedimented debris was then stirred up with more fluid and injected into the donor monkey shown in the table. If the incubation period of the donor monkey is shown in parentheses—e.g., (9) days

#### LEGENDS TO ILLUSTRATIONS ON PLATE

DR. HAWKING AND OTHERS

Fig. 1—Large parasite of *P. cynomolgi* in liver measuring 68 × 61 μ at 7 days 15 hours. (× 1250.)

Fig. 2—Parasite at 7 days 15 hours in greatly distended hepatic cell which has been reduced to a mere shell though nucleus persists undiminished. Space between parasite and cell wall is due to shrinkage during fixation. (× 1250.)

Fig. 3—Parasite at 7 days 15 hours showing normal ovoid shape when able to expand evenly in all directions. (× 1250.)

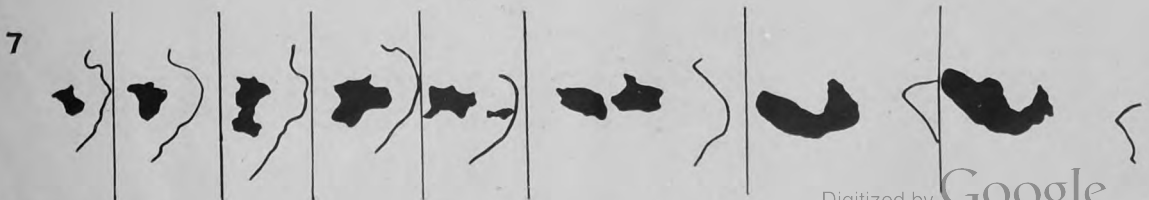
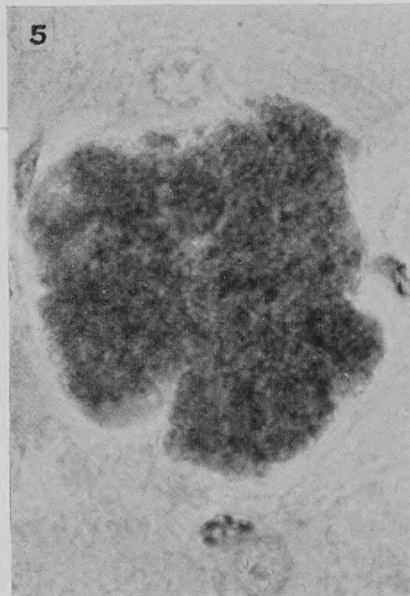
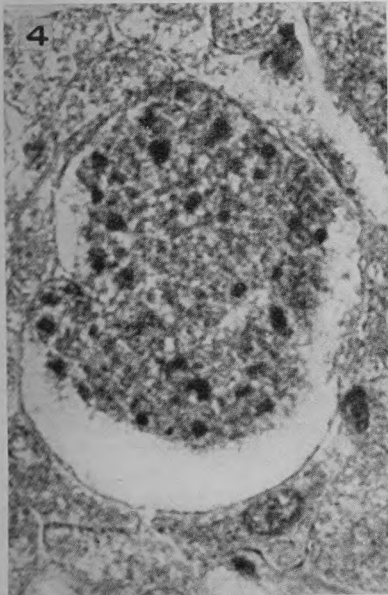
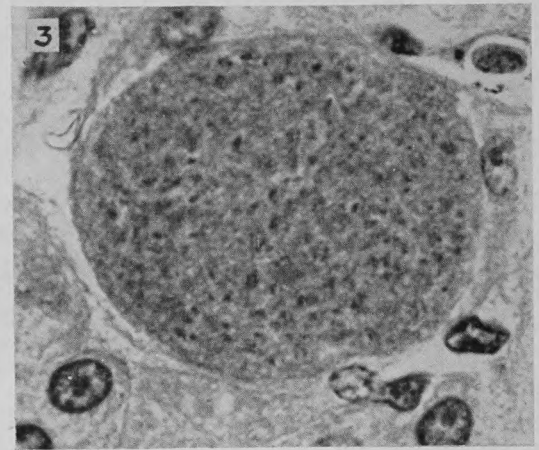
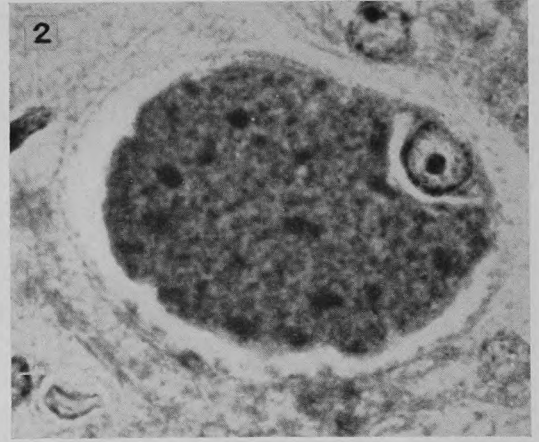
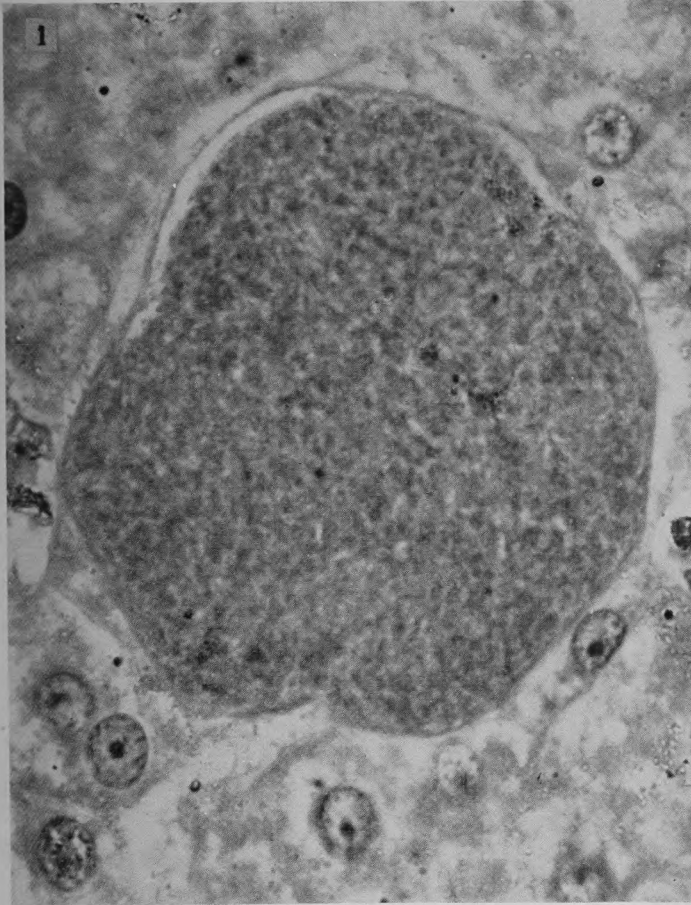
Fig. 4—Parasite at 7 days 15 hours photographed through orange filter to show cytoplasmic masses which stain dark blue with Giemsa. (× 1250.)

Fig. 5—Parasite at 7 days 23 hours, showing tendency to lobulation. (× 1250.)

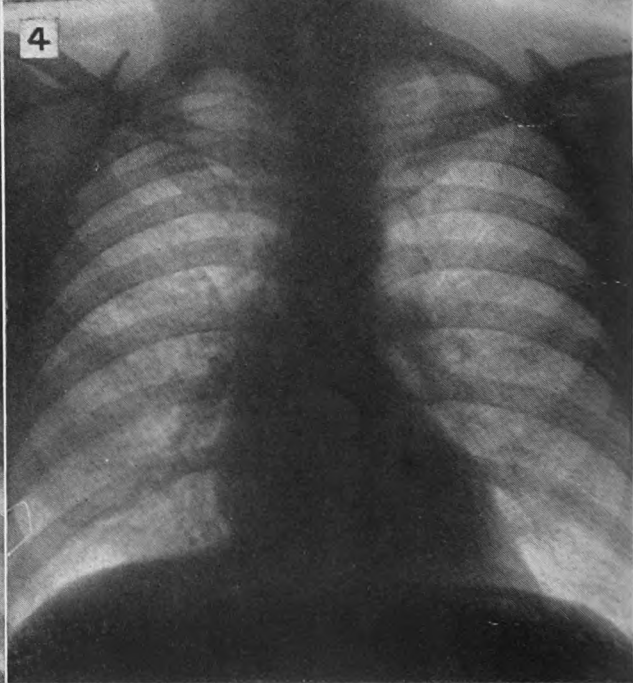
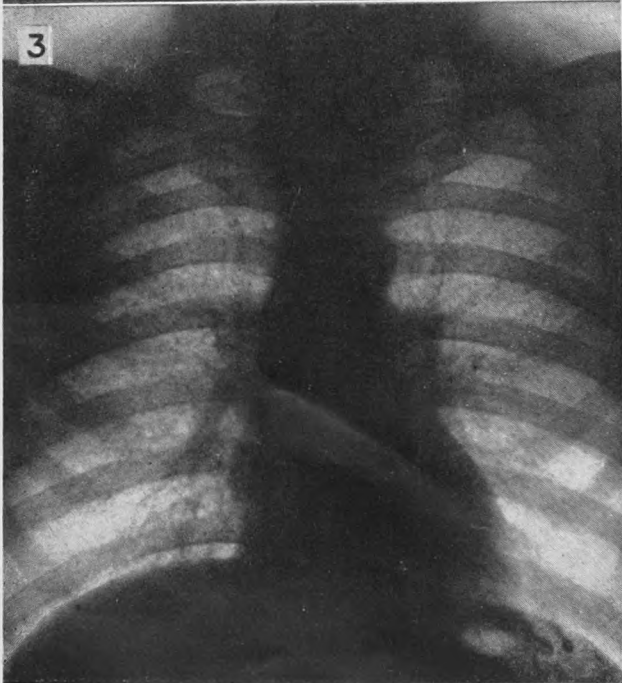
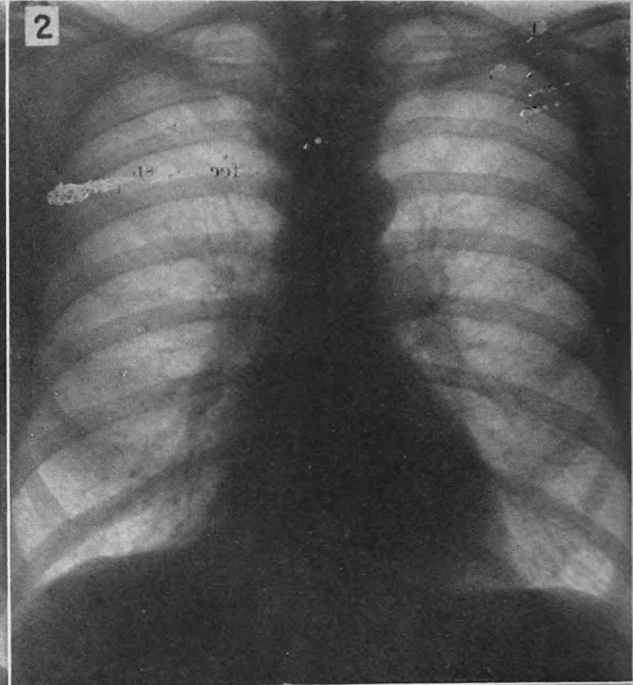
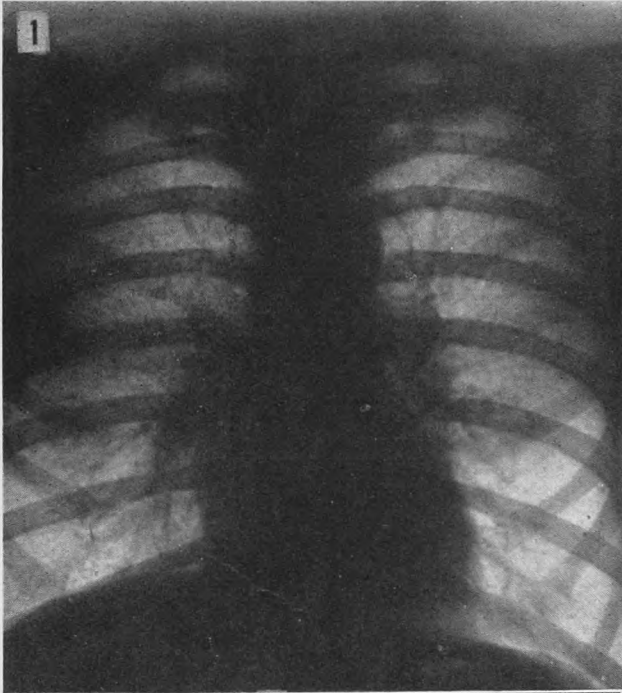
Fig. 6—Form resembling a parasite found in brain 7 1/2 days after intracerebral injection of sporozoites. (× 1250.)

Fig. 7—Successive camera-lucida drawings of serial sections 4 μ thick, showing distortion imposed on a developing parasite (solid black) at 7 days 15 hours by connective-tissue framework of liver. Black line indicates wall of adjacent vein. (× 260.)

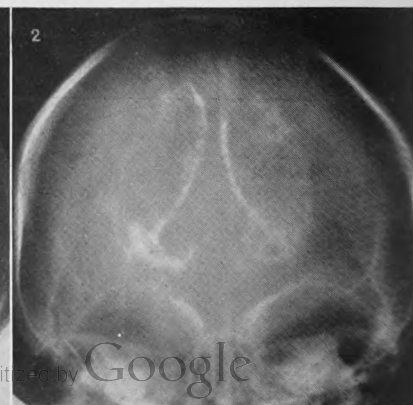
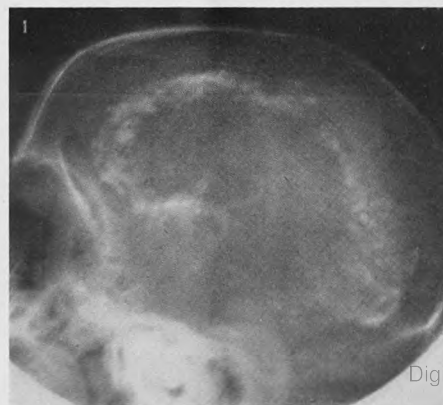
DR. HAWKING AND OTHERS : TISSUE FORMS OF A MALARIA PARASITE



DR. DOIG, DR. McLAUGHLIN : CLEARING OF X-RAY SHADOWS IN WELDERS' SIDEROSIS



DR. CAPPON :  
INTRACEREBRAL  
CALCIFICATION IN A  
MICROCEPHALIC





—this indicates that the donor monkey had been killed during the incubation period, but that a control monkey, inoculated with the washings of the mosquitoes (as above), had an incubation period of 9 days. In the first monkey shown, a tourniquet was placed round the arm and sporozoites were injected intradermally on the hand; after 2 hours 0.7 ml. of venous blood was collected distal to the tourniquet (which was then released) and was inoculated into another monkey. Both the donor and recipient monkeys became infected, showing that under these conditions sporozoites had passed from the site of intradermal inoculation into the venous blood, where they had survived for at least 2 hours. After these first few hours the blood becomes completely non-infective and remains so until 7 days 21–23 hours after the inoculation of sporozoites, when it becomes infective again. Presumably this indicates the beginning of the passage of merozoites from the parasites in the tissues (liver) into the red blood-cells.

#### Asynchronous Release of Merozoites into Blood-stream

Evidence has been obtained which indicates that (as might be expected) the release of merozoites into the blood-stream to infect erythrocytes is not synchronous but is a continuous process spread over several days. A monkey was inoculated intravenously with the washings from 120 mosquito glands (used to infect monkey 45). Beginning 8 days later, thin films of the blood were taken at short intervals day and night for the next 3 days. These were searched carefully, and the ages of all parasites detected were judged by the stage of their development. Their age being known, it was possible approximately to estimate the hour at which they had been released. Table II shows the times at which the formation of new parasites was detected. Since the blood contained no parasites at 10.45 A.M. on the 8th day (as is shown by failure to infect another monkey with 10 ml. of blood), new parasites formed during the next 48 hours—i.e., at least up to 10.45 A.M. on the 10th day—must have arisen from the tissue forms. When the blood infection of *P. cynomolgi* is well established it shows a well-marked 48-hour cycle, though it is seldom so synchronous as *P. vivax*; since the original entry of the parasites into the blood is asynchronous, the later synchronicity must be imposed on the parasite by the host.

In another experiment monkey 112 was inoculated intravenously with six heavily infected mosquitoes, and parasites appeared in the blood on the 11th day. During the first 2 days of the patent period the rate of increase was about 12.6 times per day, which is greater than the theoretical maximal rate of multiplication—i.e., 16 times per 2 days or 4 times per day. This suggests that during the 11th and 12th days after inoculation the natural rate of increase of the parasites in the blood was still being augmented by the release of further parasites from the tissues. Calculations from our data suggest that in a 3-kg. monkey inoculated with sporozoites from only a few mosquitoes—e.g., monkey 112—the number of parasites liberated into the blood is about 1 million; in monkeys inoculated with sporozoites from a hundred

TABLE II—TIME OF RELEASE OF MEROZOITES INTO THE BLOOD OF A MONKEY

—	8th day			9th day						10th day					
	P.M.	A.M.			P.M.			A.M.			P.M.				
		12	4	8	12	4	8	12	4	8	12	4	8	12	
No. of new parasites detected	1	2	0	2	1	2	4	2	2	3	1	9	5		

The 8th day 12 P.M. is 8½ days after the inoculation of sporozoites. Blood taken at 2.15 P.M. on 7th day and 10.45 A.M. on 8th day did not infect two other monkeys.

infected mosquitoes the number of parasites liberated from the tissues seems to be between 100 million and 1000 million.

#### Tissue Cultures

Among other negative findings we may mention that no parasites could be detected in tissue cultures made repeatedly from sites in the spleen, lymph-glands, or marrow, where sporozoites had previously been inoculated. Tissue cultures were also attempted from the liver, but hepatic cells did not grow.

#### MORPHOLOGICAL DESCRIPTION OF PARASITES

When large numbers of infected salivary glands were injected into the skin of the ear or into other sites by the technique described above, sporozoites could be found microscopically in sections taken up to 4 hours 20 minutes later but not after longer periods. These sporozoites were lying extracellularly and did not show any signs of further development. In four experiments sporozoites were injected parenterally by various routes and after 2–8 days the monkeys were killed. Samples of the different organs were inoculated into other monkeys to detect parasites, but the results were all negative except in one case when the blood also was infective. Examination of smears from the organs was also fruitless. After Shortt and Garnham (1948) had reported that developmental forms were found in the liver, parasites were found in sections of the liver in three of these monkeys, and the details of these experiments are therefore reproduced below. Parasites were not found in sections of the lung, spleen, kidney, brain, and heart.

**Monkey 36.**—A small monkey inoculated intravenously with the glands of 240 infected mosquitoes and intradermally with the glands of 50 mosquitoes; the glands were injected in less than 15 min. after their dissection. Samples of the blood, liver, spleen, lung, marrow, skin, and lymph-glands were injected into other monkeys, which did not become infected.

**Monkey 23.**—Inoculated intravenously and intradermally with a suspension of 36 infected mosquitoes. Exactly 5 days later the monkey was killed and the blood, lung, liver, lymph-glands, skin, spleen, and marrow were injected into other monkeys, which did not become infected.

**Monkey 116.**—Weight 2.8 kg. Inoculated intravenously with a suspension of 1000 ground-up infected mosquitoes. Killed 7 days 15 hours later. Samples of blood and practically all the organs were inoculated into other monkeys, which did not become infected. Samples of the lung, liver, and spleen were minced and incubated at 37°C in a mixture of serum and Tyrode's solution for 24 hours, as for tissue culture, and then injected into a monkey, which did not become infected; the liver cells had survived poorly, but the cells of the spleen and lung seemed fairly good when injected.

**Monkey 45.**—Aged 3 months, born in the Institute. Inoculated intravenously and intradermally with the glands of about 80 infected mosquitoes. The monkey was killed 7 days 23 hours later, and samples of the blood, liver, spleen, lung, brain, marrow, skin, lymph-glands, skeletal and cardiac muscle, and fat were inoculated into other monkeys. The monkeys which received the blood, liver, spleen, and lung became infected after incubation periods of 14, 16, 16, and 18 days respectively; the other monkeys were not infected.

#### LEGENDS TO ILLUSTRATIONS ON PLATE

DR. DOIG, DR. MCLAUGHLIN

Fig. 1—Siderosis in electric-arc welder (case 2), showing pulmonary reticulation with tendency to formation of nodules.

Fig. 2—Same case as in fig. 1 but 11 years later, showing complete clearing of lungs.

Fig. 3—Siderosis in electric-arc welder (case 1).

Fig. 4—Same case as in fig 3 but 12 years later, showing partial clearing of lungs.

DR. CAPPON

Figs. 1 and 2—Lateral and anteroposterior views of skull showing symmetrical calcification in the brain, possibly in the walls of the lateral ventricles.

In all these experiments control monkeys were inoculated with washings from the suspensions of sporozoites used, and they showed parasites in the blood after 9-11 days.

#### Parasites in the Liver

In the material obtained from the liver 2 days after the inoculation of sporozoites (monkey 36) no certain parasites could be detected in spite of careful search. In some sections there were small round intracellular bodies, about  $3\ \mu$  across, staining deep purple with Giemsa's or with Maximow's stain, but their nature could not be determined with certainty.

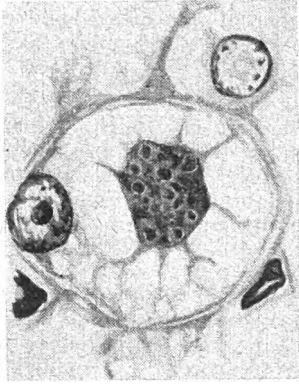


Fig. 8—Parasite, at 5 days after inoculation of sporozoites, lying in vacuole in already distended hepatic cell. ( $\times 1250$ .)

Material from the liver 5 days after inoculation of sporozoites was available from monkey 23. This material had been fixed in formalin-Zenker and embedded in celloidin. The parasites are moderately numerous, about 1-3 being present per section measuring  $0.5 \times 1.0\ \text{cm}$ . They have average diameters of  $12$  by  $14\ \mu$  (range  $8.4$ - $20.0\ \mu$ ). Most of them are approximately spherical in shape, but some are angular or indented, apparently as a result of shrinkage during fixation (fig. 8). pieces of chromatin can be discerned, though they stain poorly after this fixative; they are much the same size and shape as those seen at 7 days (monkey 116). Over 70 have been counted in one parasite; they are distributed approximately uniformly through the parasite. The cytoplasm shows no special structures. The parasite lies in a cell which is clearly a distended parenchymatous cell. In sections from this monkey the parasites are surrounded by a clear empty space, which may represent a vacuole round the parasite or may be an artefact. The nucleus of the host cell is unchanged or possibly slightly enlarged.

Material removed from the liver 7 days 15 hours after inoculation of sporozoites was available from monkey 116; this material was fixed in formalin-Zenker or in Schaudinn and embedded in paraffin. The normal shape of the parasite at this stage is ovoid, the average cross-section of typical forms at their largest section measuring  $46 \times 31\ \mu$  (range  $25$ - $68\ \mu$ ) (figs. 3 and 9). The largest parasite found measured  $68 \times 61\ \mu$  (fig. 1). The normal ovoid shape of the parasite is, however, realised only

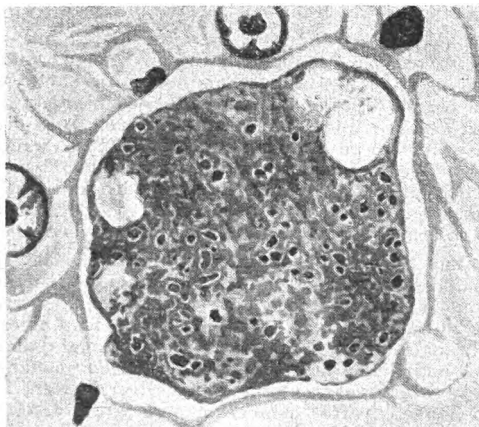


Fig. 9—Parasite at 7 days 23 hours, showing vacuoles. ( $\times 1250$ .)

when the pressure of surrounding structures is distributed evenly. When the parasite develops in a position where even expansion is hindered by connective-tissue bundles, &c., great distortion can occur, and long processes may be pushed out in directions where resistance is low, as might happen if a toy balloon were inflated inside a net of irregular mesh (fig. 7).

The pieces of chromatin are scattered evenly throughout the whole parasite; there may be 100-250 pieces in one large cross-section. They are roughly quadrilateral or triangular and measure  $1.0$ - $1.2\ \mu$  across. Some of the pieces of chromatin have an appearance suggesting bifurcation. The cytoplasm is approximately uniform throughout the parasite, and at this stage it is not especially concentrated round the pieces of chromatin. It may, however, contain various structures. In some parasites there are large circular, oval, or triangular masses (staining blue with Giemsa) measuring up to  $7\ \mu$  in length; ten may occur in one cross-section. These bodies are best seen in material fixed in Schaudinn or in Sanson-Carnoy (monkey 45); their edges are often indeterminate, and they appear to be condensations of the cytoplasm (figs. 4 and 10). Secondly, there are often large vacuoles, particularly at the surface of the parasite and towards one pole—they measure up to  $20\ \mu$  across and are often filled with material staining pale pink (fig. 9). Thirdly, in some of the parasites there are one or more spherical bodies measuring  $1$ - $2\ \mu$  across and staining dark purple; their significance is unknown (figs. 10 and 12).

The parasite lies inside a liver cell, which becomes greatly distended as the parasite grows (the original average size of the liver cells being about  $16 \times 20\ \mu$ ). The cytoplasm of the cell becomes flattened into a thin membrane round the parasite, with the result that it is hardly discernible except where the parasite has shrunk away from it during fixation (fig. 2). The nucleus of the liver cell, however, retains its shape and size; in some cases it is even slightly hypertrophied (diameter increased up to 20%) compared with adjacent parenchymatous nuclei, and it often stains pink while the adjacent nuclei stain blue. Presumably the nucleus retains its metabolic activity which now serves the parasite rather than its own cytoplasm. In a few cases two nuclei of the host cell can be demonstrated, corresponding to the two nuclei which are common in hepatic cells. In the hepatic lobule the parasite is generally situated nearer to the central vein than to the interlobular vein but not usually adjacent to either. Occasionally parasites are found near the central vein, and rarely they have been seen on the periphery of the lobule.

Material removed from the liver at 7 days 23 hours after the inoculation of sporozoites was available from monkey 45. Specimens of this material were fixed in formalin-Zenker, Schaudinn, formol Muller, Bouin, Sanson-Carnoy, and 70% alcohol respectively and embedded in paraffin. In general the parasites found are similar to those of monkey 116 just described. The average cross-section is  $40 \times 26\ \mu$  (range  $10$ - $65\ \mu$ ). In some of the parasites, particularly after Bouin fixation, large clefts have been seen in the cytoplasm, corresponding to those depicted by Huff (1942) for *Leucocytozoon* and other parasites. Though these may be artefacts due to



Fig. 10—Parasite at 7 days 15 hours, showing dense masses in cytoplasm which stain blue with Giemsa. ( $\times 1250$ .)

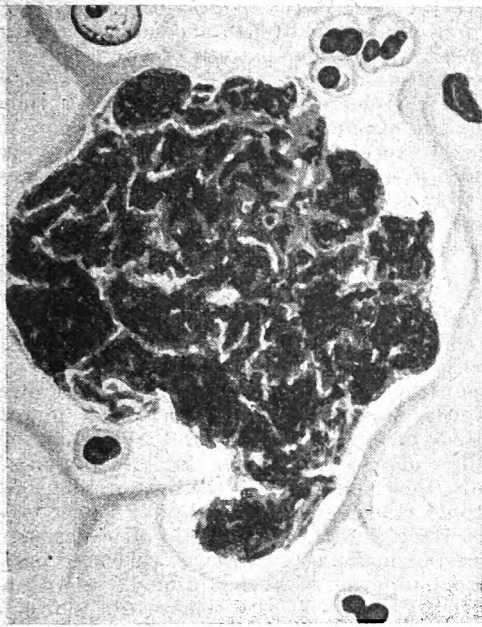


Fig. 11.—Parasite at 7 days 23 hours, showing apparent subdivision into cytomeres. ( $\times 1250$ .)

fixation, they indicate lines of weakness in the internal structure. The outer parts of some parasites are lobulated quite apart from the deformation often imposed by the pressure of external structures (fig. 5); and some of the parasites tend to split, as shown by elongated vacuoles. In some sections the appearances suggest that the parasite is subdivided into many cytomeres measuring about  $6 \mu$  across (fig. 11); but the masses are not sufficiently demarcated for one to be certain on this point. Rare parasites appear to be breaking up into small merozoites which are not arranged in any special manner. One instance is illustrated in fig. 13, which shows a small section of a parasite with chromatin distributed according to no regular pattern; in the sinusoid near by there are five small dark purple bodies, apparently merozoites, but it is difficult to discern their structure further.

During the earlier stages of the parasite, as seen in monkeys 23 and 116, the host had shown little or no reaction to the plasmodium, though adjacent hepatic cells were compressed and caused to atrophy by its expansion. In monkey 45 there are often several leucocytes round the parasites (fig. 12). Most of these are polymorphs, but cells with large or small round nuclei and cells with kidney-shaped nuclei may be seen.

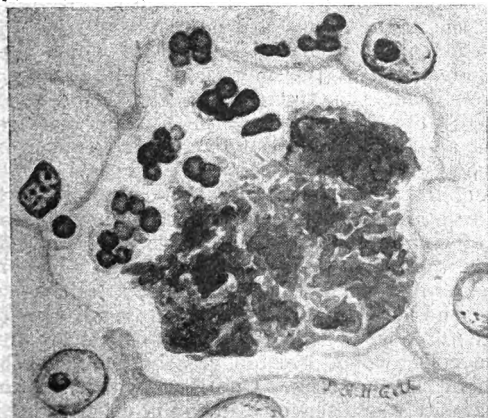


Fig. 12.—Leucocytes collected round a parasite at 7 days 23 hours. ( $\times 1250$ .)

Most of these cells are outside the parasite and its envelope of host cell, but in some cases a polymorph is embedded in the substance of the parasite. The adjacent part of the parasite does not show any particular change therefrom. It is not clear whether this leucocytic reaction is due to the parasite's having been present 8 hours longer than in monkey 116, or whether monkey 45 was particularly disposed to such cellular reactions, perhaps because it was only 3 months old.

One other experiment deserves mention. Monkey 84, weighing 4 kg., was inoculated intracerebrally with the glands of 50 infected mosquitoes in 0.08 ml. of fluid. During the next 5 days it was given *p*-aminobenzoic acid 4 g. daily in the hope of promoting the multiplication of the tissue forms, then undiscovered; unfortunately this seemed to have an adverse effect on them, and the monkey did not show parasites in the blood until the 17th day after inoculation. At 7 days 8 hours after inoculation the site of intracerebral inoculation was removed for biopsy. Smears from part of the specimen showed no parasites. The rest was fixed in formalin-Zenker. In the sections a single form was found (fig. 6). It measured  $40 \times 24 \mu$  and contained numerous pieces of what appeared to be chromatin measuring about  $1.4 \mu$  across. There was a rather thick outer covering, and at one corner there was a cell nucleus, presumably that of the host cell. The form was situated in the surface of the grey matter of the brain and was partly surrounded by red blood-cells owing to hæmorrhage during biopsy. Adjacent serial sections on one side showed that in that direction the form was semi-ovoid; the sections on the other side were not available. It is considered that this form was probably a stage of *P. cynomolgi* developing in an abnormal situation owing to the method of inoculation; but it is impossible to prove this.

#### DISCUSSION

The plasmodial masses found in the livers of monkeys inoculated with sporozoites of *P. cynomolgi* resemble those described by Shortt, Garnham, and Malamos (1948), allowing for different stages of development, and our material confirms their discovery. It is believed that these plasmodial masses represent developmental stages of the malaria parasite between the sporozoite and the well-known blood forms, because (1) they have not been found in the livers of uninfected rhesus monkeys, (2) their general appearance is that of a tissue form of the hæmosporidia, and (3) the timing of their growth coincides with the later stages of the forms postulated by this hypothesis. The initial stages of these parasites, including the early development of the sporozoite in the monkey, are not known. Careful search through sections of the liver of monkey 36, which had received a large inoculum of sporozoites 48 hours earlier, did not reveal any of these forms, though this monkey had received eight times as large an inoculum as monkey 23, which was killed on the 5th day and showed relatively many parasites in the liver. The failure to demonstrate early stages on the 2nd day and the rapid enlargement of the parasites from  $14 \mu$  diameter after 5 days to  $46 \mu$  after  $7\frac{3}{4}$  days make it doubtful whether the first 5 days have been occupied merely by the growth of each sporozoite into a parasite such as those found.



Fig. 13.—Tip of ripe schizont, and five merozoites lying in adjacent sinusoid at 7 days 23 hours. ( $\times 1250$ .)

The development of the parasite of mammalian malaria may be compared with interest to that of the parasite of bird malaria and similiar protozoa. The sporozoite of *P. gallinaceum* enters reticulo-endothelial cells of the skin, spleen, &c., and passes through three or four generations before the parasite enters a red blood-cell; these stages in the reticulo-endothelial cells (the well-known exo-erythrocytic forms) often reappear later in the infection. This is clearly quite different from the development of *P. cynomolgi*; in fact in the search for mammalian tissue forms the analogy of *P. gallinaceum* has been a false clue which has blinded seekers to their real location and nature. A closer analogy is given by the well-known monkey parasite *Hepatocystes (Plasmodium) kochi*, the life-history of which has only recently been elucidated by Garnham (1948). In this case the asexual cycle develops in hepatic parenchymatous cells, large cysts 2 mm. in diameter being eventually formed, after which merozoites enter the red blood-cells to form gametocytes. A similar parasite with asexual schizonts in hepatic cells and gametocytes in the red blood-cells has been described in bats by Mer and Goldblum (1947). The hepatic forms of *P. cynomolgi* also show interesting resemblances to the enormous schizonts of *Leucocytozoon simondi* described by Huff (1942). As soon as the tissue forms of the parasites of human malaria have been properly described, the classification of all this group of parasites, the hæmosporidia, will have to be completely revised.

The evolution of these parasites is also of great interest. According to Reichenow (1939) this group of protozoa is probably derived from parasites of the intestinal epithelium of vertebrates resembling the eimeridia. The most primitive representatives of the order, such as *Eimeria*, develop only in the intestinal epithelium. Other parasites are known, such as *Schellackia* in lizards, in which part of the development takes place in the intestinal epithelium and part in the subepithelial connective tissue and in the erythrocytes and lymphocytes of the blood; in other members of the group—e.g., *Lankesterella* of frogs—development in the vertebrate host takes place in the endothelial cells of the blood-vessels and in the blood-cells. In bird malaria, as already described, the sporozoites of *P. gallinaceum* give rise to asexual schizonts which develop in the reticulo-endothelial cells and the gametocytes, and asexual schizonts of a second type develop in the red blood-cells. The development of *P. cynomolgi* and *Hepatocystes kochi* in hepatic parenchymatous epithelium (embryologically derived from intestinal epithelium) recalls the intestinal origin of the whole group.

The phylogenetic consideration of the subject also brings out another interesting possibility. In bird malaria—e.g., *P. gallinaceum* and *P. relictum*—the schizonts in the tissues eventually liberate merozoites of two kinds—micromerozoites which enter erythrocytes to become gametocytes and trophozoites, and macromerozoites which enter other reticulo-endothelial cells to carry on the development in the tissue (Reichenow and Mudrow 1943, Huff and Coulston 1944). The formation of micro- and macro-merozoites has been demonstrated in many other members of the coccidia and is obviously a fundamental feature of the whole order. Accordingly one would expect to find some evidence of it in mammalian malaria, even though one type of merozoite might be reduced to vestigial forms. So far no evidence for two kinds of schizonts has been found in the material described above. But, if this view is correct, the forms described here should be considered to represent the development of micromerozoites which will invade the erythrocytes and form gametocytes and trophozoites, while another type of schizont (not yet identified and probably occurring only in small numbers) might form macromerozoites which would invade liver cells to

continue the cycle in the tissues. Infections of *P. cynomolgi* in monkeys tend to spontaneous cure in 6–8 months, and there is no regular pattern of late relapses as with *P. vivax* infections; consequently *P. cynomolgi* may not show the macromerozoite cycle so well as do some other mammalian plasmodia. Among the human malaras one would expect to find the macromerozoite cycle well developed in quartan (notorious for its long persistence), moderately developed in benign tertian (in which relapses continue for one or two years), and inconspicuous in malignant tertian (in which late relapses are rare).

Shortt, Garnham, Covell, and Shute (1948) have shown that forms similar to those described above also occur in the human liver during infection with *P. vivax*; their clinical significance may be briefly considered. First, it is unlikely that their presence in the liver during the incubation period or during later phases of malaria causes any direct symptoms, since their number will usually be relatively small, and symptoms are not generally observed during the incubation period. Secondly, their persistence in the liver and later reactivation would explain the relapses after longer or shorter periods which are so characteristic of benign subtertian and quartan malaras. However, this may not be the sole explanation for relapses; in monkeys with a latent infection of *P. cynomolgi* a relapse can almost always be provoked by splenectomy, but this occurs as readily with blood-induced infections as with sporozoite-induced ones. Thirdly, these tissue forms might explain many phenomena in the chemotherapy of malaria. According to the investigations of Fairley et al. (1947) and many earlier workers, quinine, mepacrine, chloroquine, and similar compounds do not prevent infection if given during the incubation period after the bites of infective mosquitoes; though they have a strong therapeutic action on the blood forms of the established infection; this would be explained by the insusceptibility of the tissue forms to these compounds. Pamaquin and 'Paludrine' seem to possess some activity in partially preventing the development of *P. vivax* infections, and this would be explained by the susceptibility of the liver forms to these drugs. It is hoped to investigate this aspect of the subject further.

#### SUMMARY

The early developmental forms of *Plasmodium cynomolgi* in monkeys—which closely resembles the parasite of benign tertian malaria (*P. vivax*) in man—are described. The announcement by Shortt and Garnham (1948) that these forms occur in the liver is confirmed.

When sporozoites are injected into monkeys they can be traced for 2–4 hours in the blood and subcutaneous tissues by subinoculation and by microscopy. After that (as is well known) they disappear; and they cannot be detected by subinoculation for 8 days, after which the blood becomes infective again. During this prepatent period the tissue forms are not transmissible by subinoculation even of material (liver) in which they can be demonstrated by the microscope. The passage of the parasites from the tissues into the blood was first detected 7 days 23 hours after the injection of sporozoites into the animal, and it seems to continue asynchronously for several days.

Plasmodial masses similar to those reported by Shortt and Garnham were found in material removed from the livers of monkeys 5 days, 7 days 15 hours, and 7 days 23 hours after the injection of sporozoites. These masses represent stages in the early development of the parasite. By the end of the 7th day they may measure on the average  $46 \times 30 \mu$ . They lie inside hepatic parenchymatous cells, which become greatly distended by the growth of the parasites. One form which appeared to be a parasite was discovered in the brain after intracerebral injection of sporozoites. The histological appearance of the parasites is described and illustrated.

Grateful acknowledgments are due to Miss I. M. Tonkin, B.Sc., and Mr. R. Hunt for the entomological work; to Miss R. J. Berson, Miss P. Davey, Miss V. D. Markham, and Mr. E. C. England for technical assistance; to Mr. F. Higginson for the histological preparations; to Dr. P. G. H. Gell for the drawings; and to Mr. F. Welsh, F.R.M.S., and Mr. C. Sutton for the photographs.

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(1945) described siderosis in 4 silver finishers who had inhaled iron oxide (rouge) at work for many years. One of these men died after a gastric operation, and no fibrosis of the lungs was found. Three confirmatory necropsies were described by Barrie and Harding (1947). It was also shown by experiments with sponges that iron-oxide dust is opaque to X rays. Harding (1945) and Harding et al. (1947) introduced iron oxide into the lungs of rats both by intratracheal injection and by inhalation and obtained radiographs comparable with those obtained in human siderosis. Histological studies showed that fibrosis did not develop in relation to the deposits of iron-oxide dust in the lungs.

Since 1936 we have continued our examinations of some hundreds of welders (electric-arc, carbon-arc, and oxyacetylene) and have found siderosis in each group, but we have delayed publication in the hope of an opportunity, which has so far not presented itself, for necropsies and histological studies. The fact that only one necropsy in a case of welder's siderosis has been reported (death was due to an accident) is evidence that the condition is not morbid. We have been constantly on the look-out for necropsy material.

## FOLLOW-UP OF ORIGINAL CASES

In October, 1945, we re-examined 15 of the cases described by us in 1936, and in some respects the results are instructive. All except 2 of them had continued to work full time as welders, and all had remained in good health. One man has given up welding entirely, and the other has become a welding instructor. These 2 cases are described in greater detail below. Of 7 men who showed no specific radiographic changes due to dust in 1936, 5 (average age 33.3 years, average welding exposure 14.8 years) still show no abnormal changes; 1 (aged 35, sixteen years welding) was now classed as suspicious; and 1 (aged 30, fifteen years welding) showed a definite but slight degree of radiographic reticulation. Classed as suspicious in 1936, 2 welders showed in 1945 a definite picture of welders' siderosis; their ages were 29 and 31 years and their welding experience fifteen and seventeen years. Of 6 men who previously showed definite inhalation changes 5 continued to do so in 1945. In 4 of these (average age 55.25, average welding experience 32.25 years) there was no change in the intensity of the abnormal X-ray shadows. In one case (case 2 below) there was a considerable clearing of the shadows. The other man (case 1) had a normal chest film where previously he had shown pronounced radiographic changes due to inhalation of dust.

## COMPLETE CLEARING OF X-RAY SHADOWS

This man was case 2 in our 1936 published series. He was first seen in 1934, when he was 35 years old and had been an electric-arc welder for eleven years. He had not been previously exposed to dust. His welding experience had included about half his time in various types of storage tanks with an average capacity of 500 gallons. Nearly all his work was on uncoated mild steel, and he had not used bare wire electrodes or the carbon-arc method. Except for a slight cough and occasional morning sputum he had no symptoms of ill health.

*Clinical examination* revealed a chest expansion equal on both sides but rather less than normal. The percussion note was not impaired; the breath sounds were harsh, with prolongation of the expiratory murmur over both lower zones, especially in the mid-axillary area; and post-tussic crepitations were heard at the bases. Examination of the sputum disclosed large numbers of macrophages packed with fine granules of iron oxide giving the Prussian-blue reaction. No asbestos bodies were seen.

*Radiography* showed a well-marked reticulation with a tendency to early nodule formation (fig. 1). On being informed that his radiograph was not normal he gave up his work as

## CLEARING OF X-RAY SHADOWS IN WELDERS' SIDEROSIS

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H.M. MEDICAL INSPECTORS OF FACTORIES

*With illustrations on plate*

In 1936 we described the abnormal X-ray shadows in the chest films of some electric-arc welders and emphasised that they were found in men who were apparently in good health (Doig and McLaughlin 1936). We were unable at that time to come to a conclusion about the cause of the condition, but suggested that the iron-oxide particles in the welding fume, when inhaled, "might be opaque to X rays and produce the picture without the associated presence of fibrosis and congestion." Our original observation has been amply confirmed by many investigators, including Enzer and Sander (1938), Britton and Walsh (1940), Koelsch (1941), Cramer (1942), Humperdinck (1942), Groh (1944), and Jones and Lockhart (1944).

Enzer and Sander's article, illustrated with excellent photomicrographs, contains the only published account of the pathological investigation of the lungs of a welder who had died after an accident and who during life had shown the characteristic radiographic changes.

Apart from lobar pneumonia in the left lung, both lungs showed a finely distributed black pigmentation throughout and there was no tuberculosis. On histological examination the lymph-glands showed irregularly distributed pigment almost all of which was within large macrophages. In the lungs there was much amorphous pigment, mainly in periarterial but also in peribronchial lymphatic channels and alveolar septa. No fibrosis was found either in the glands or in the lung tissue; the blood-vessels were not obliterated, even where the pigment was most dense, and the walls were not thickened. Chemical analyses of two samples of the lungs showed 0.096 and 0.089 mg. of silica per 100 g. No quantitative analysis for iron was made, but both in sections of the lungs and glands and in the residue left after microincineration the Prussian-blue reaction for iron was obtained.

Enzer and Sander conclude that the radiographic appearances were caused by the deposition of iron oxide in the lungs resulting from inhalation of the welding fume, and point out the apparently inert nature of the pigment and the absence of functional impairment.

The condition can be called siderosis, not in the sense in which Zenker originally used the term as implying the presence of fibrosis, but simply meaning the presence of iron dust in the lungs. Subsequent investigations have shown conclusively that iron oxide in its pure form does not set up fibrosis in the lungs. McLaughlin et al.

a welder to become a storekeeper and thus had no further exposure to welding fume. Radiography sixteen months later showed that the shadows were still present, but that the reticular strands had become blurred, suggesting congestion in the areas of dust deposition. Subsequent films until 1938 showed that the blurring had persisted, but that there was a definite decrease in the intensity of the shadows.

*Follow-up.*—The man was not seen again until 1945, when he looked healthy and said that he felt very well. He had no regular morning cough or sputum, chest movements were of moderate degree, and percussion and auscultation revealed no abnormal signs. A radiograph of the chest showed the complete disappearance of the blurring, reticulation, and mottling, the film being normal except for a slight residual accentuation of the normal linear markings (fig. 2).

#### PARTIAL CLEARING OF X-RAY SHADOWS

The man in whom the X-ray shadows became less intense was case 1 of our 1936 series. He was first seen in 1933 when he was 44 years of age. Because of slight staining of the sputum he was sent to a tuberculosis clinic and there seen by one of us (A. T. D.). His father and grandfather had both died of silicosis. He himself had worked as a blacksmith for eighteen years, occasionally doing a little arc welding, and after that for eleven years he had been a full-time arc welder doing half his work with covered electrodes in enclosed spaces. When seen he had no pronounced symptoms except a slight occasional cough and he had the appearance of a perfectly fit man, with excellent build, musculature, colour, and nutrition.

*Physical examination* revealed few abnormal physical signs except somewhat harsh breath sounds and a few fine post-tussive crepitations at the bases. He continued to work as a welder in the same factory but under improved conditions of ventilation.

*Follow-up.*—We made periodical examinations until 1938, and these continued to reveal a satisfactory state of general health, with no change in the degree of siderosis. He was lost sight of in 1938 but was traced in 1945. It was found that since 1940 he had given up full-time welding and had become a welding instructor at a technical college. This meant that his exposure to welding fume was a great deal less than when he was working at the factory. He estimated that only a quarter of his time was spent in actual welding, and that only in short breaks, in demonstrating the technique of the work or in correcting faults. No work in confined spaces was done at the technical college. We could not examine him ourselves and are indebted to Group-Captain J. G. Somerville, No. 3 R.A.F. Rehabilitation Unit, who made a clinical examination in June, 1945, and reported: "The man says he feels very well and has no complaints. There is no cyanosis and no dyspnoea on exertion, and no abnormal clinical signs can be found in his chest." The radiograph taken at the time was sent to us. It still showed a definite degree of siderosis, but compared with those taken before 1938 there was considerable resolution as shown by diminution in the intensity and concentration of the lesions. The film now shows no nodulation, but merely a rather coarse reticulation with some blurred "beading" of the bronchi (figs. 3 and 4).

#### DISCUSSION

Siderosis is one of the benign pneumoconioses, a term applied by Pendergrass and Leopold (1945) to those cases in which inert dusts are deposited in the lungs causing characteristic radiographic changes but no fibrosis or disability. Etymologically, the word pneumoconiosis merely means "dust in the lungs" and does not carry with it the concept of fibrosis, but textbooks usually define it as fibrosis of the lungs due to dust. In the Workmen's Compensation Act, 1943, and in the National Insurance (Industrial Injuries) Act, 1946, pneumoconiosis is defined as "fibrosis of the lung due to silica dust, asbestos dust and includes the condition of the lungs known as dust reticulation." For compensation purposes the term must necessarily be restricted to a disabling condition. Recently, however, there has been a tendency to restrict it still further to those cases

showing radiographic reticulation of the lungs in contrast with those showing nodulation, and there seems to be little justification for this practice. The difference between the medical and legal concepts of pneumoconiosis should be kept clearly in mind.

So far as we are aware, no previous reports have appeared in which the disappearance or even retrogression of the lesions of pneumoconiosis are described. Bentzen (1933) records a case of "acute siderosis" in which a man worked for two months at a machine for crushing steel sponge and was exposed to a very light spongy dust which oxidised quickly. The radiographic changes consisted of irregular fine mottling which resolved to some extent later and were interpreted as a miliary pneumonia. In view of the short exposure it seems to us that this term is more applicable than acute siderosis. Our 2 cases provide clinical and radiographic evidence to support the view that some dusts, though producing abnormal X-ray shadows when enough is inhaled, merely lie inertly in the tissues and cause no proliferation of fibrous tissue or other permanent reaction. The normal scavenging mechanism of the lungs does not appear to be impaired. Some of the dust is drained away in the lymphatics to the lymph-glands, and it is conceivable that some might pass through the lymph-glands after being extruded from the phagocytes in which they arrived in the glands and be finally discharged into the blood-stream through the thoracic duct. It is likely, however, that much of the dust is removed from the lungs in the sputum. We showed in 1936 that elimination of the dust by the sputum was actively going on, in one case eighteen months after the man had given up welding. This is the man whose radiograph now shows no abnormal shadows. Barrie and Harding (1947), as a result of their necropsies of silver finishers, have also concluded that most of the inhaled iron dust is eliminated in the sputum. It appears therefore that in cases of benign pneumoconiosis, when no more dust is inhaled or when the amount inhaled is less than the amount eliminated, the accumulated dust tends gradually to clear away, with a corresponding improvement in the radiograph.

Though necropsies in cases of siderosis are few, there is a constantly growing body of evidence that it does not seriously affect the worker's health. Clinical examinations (Enzer and Sander 1938, Sander 1947, Britton and Walsh 1940, Humperdinck 1942, Groh 1944, Doig unpublished) show no signs of fibrosis or of diminished pulmonary ventilation. Enzer et al. (1945) found no statistically significant difference between 15 welders with siderosis and a group of normal men in a comparable age-group as regards vital capacity, pulmonary ventilation, and endurance in static and dynamic work. Further evidence of the inert nature of iron in the respiratory tract is found in descriptions of benign pneumoconiosis in occupations, other than welding, involving exposure to fine iron or iron-oxide dust. Otto (1939) mentions a case of siderosis in a man employed in an ochre mine and mill. There were few subjective symptoms. Buckell et al. (1946) found 15 out of 171 persons exposed to iron dust in iron turneries showing radiographic reticulation, but symptoms were few. Pendergrass and Leopold (1945) record 4 cases of benign pneumoconiosis among 50 steel grinders; Sander (1947) describes 3 cases in oxyacetylene cutters; and Hamlin (1947) 4 cases in foundry grinders and burners. In all three series the men worked in rooms where there was also exposure to silica dust as well as iron, but the amount of silica dust was considered too low to cause silicosis. On the other hand, we know of an electric-arc welder who worked in a steel-fettling shop exposed to free silica dust as well as to the iron oxide of the welding fume and who died from silicosis (H. E. Harding, personal communication). But when the exposure to the dust of iron or its oxides is uncomplicated

by other factors it does not set up a disabling condition. Perhaps this statement should be qualified by saying that, over a 12-year period of observation, siderosis in welders has not been found to cause disability.

#### SUMMARY

The published work relating to the benign pneumoconiosis or siderosis of welders is briefly reviewed. There is evidence that the condition is not accompanied by fibrotic changes in the lungs or by obvious disability.

In a re-examination of 15 welders examined nine years or more previously 5 of 7 men with no abnormal radiographic changes at the first examination were still normal; the sixth man of this group showed suspicious and the seventh early but definite inhalation changes (reticulation); 2 men who previously had suspicious changes had definite radiographic reticulation; and 4 of 6 men who had originally shown well-marked radiographs of welders' siderosis still had the same condition. All these men had continued to work as welders and had remained in good health.

The cases of 2 men are outlined of whom one had given up welding and the other had spent less time at the job. In the first case the abnormal shadows completely disappeared, and in the second the shadows became less intense.

These 2 cases provide evidence that the radiographic reticulation and nodulation of welders, siderosis is not necessarily permanent, and that the iron-oxide dust can be eliminated from the lung parenchyma after some years.

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## PULMONARY TUBERCULOSIS TREATED WITH p-AMINOSALICYLIC ACID

EARLY RESULTS IN 6 CASES

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REPORTS on the systemic treatment of pulmonary tuberculosis with p-aminosalicylic acid (P.A.S.) have been published by Lehmann (1946, 1947) and Vallentin (1947), while Dempsey and Logg (1947), in the course of their work on the local administration of this drug in tuberculous empyema, treated a few patients systemically but for short spells only, because of limited supplies (personal communication).

At Colindale Hospital we gave P.A.S. by mouth to 5 patients for sixty days and 1 patient for four weeks, after which the supply of the drug allocated for this trial was exhausted.

As supplied to us, P.A.S. was a white crystalline powder, and from this the sodium salt was prepared, giving, even at a concentration of 30%, a clear solution as described by O'Connor (1948). Preparation of the sodium salt requires patience and accuracy; if the final pH is taken to 7, or if the solution remains exposed to air, it becomes darker but remains translucent. The solution has a bitter but not unpleasant taste, which can be readily disguised with flavouring agents.

All the patients were given 12 g. of P.A.S. daily in divided doses three-hourly, one night dose being omitted. I gave a sixty-day course in cases 1, 2, and 3; Dr. Jannette Owen gave a sixty-day course in cases 4 and 5; and Dr. Grace O'Malley gave a four-week course in case 6. All the patients were men. The results are summarised in the accompanying table. As regards the patients not treated by myself I have interpreted the data supplied to me.

Case 1.—A man, aged 19, was admitted on Aug. 5, 1947, with an exacerbation of pulmonary tuberculosis, which had originally been diagnosed in 1941. He went rapidly downhill and was severely toxic. By December his weight had fallen from 119 to 107 lb. A large cavity in the left apex had increased from  $3 \times 3\frac{1}{4}$  in. to  $3\frac{1}{2} \times 4$  in. and showed a fluid level. Penicillin 9 mega units, in six days, had no effect on his general condition or temperature, and on Jan. 27, 1948, a course of P.A.S. was started.

There was dramatic improvement after the first few days—the toxicity disappeared, appetite returned, and he became interested in his surroundings and asked to be taken back to the general ward from the side ward where he had been kept for two months. He gained 27 lb. in eight weeks.

Radiography (April 19, 1948) showed that the cavity had lost its fluid level and had shrunk from  $3\frac{1}{2} \times 4$  in. to  $2\frac{3}{4} \times 2\frac{1}{2}$  in. There was considerable contraction and hardening of the apical lesions and clearing of the soft mottling in the other zones.

His general condition remained very good three weeks after the completion of the course; but his evening temperature rose above 99°F, his erythrocyte-sedimentation rate (E.S.R.) remained unchanged, the number of bacilli per field increased to 5, and he lost 2 lb. in weight.

Case 2.—A boy, aged 16, with rapidly advancing tuberculous pneumonia involving the whole left lung. By the end of December, 1947, he was severely toxic and rapidly going downhill, with a hectic pyrexia (see figure).

After a course of 9 mega units of penicillin, P.A.S. was started on Jan. 27, 1948. The change in the clinical picture was even more remarkable than in case 1. Toxicity disappeared on the fourth day, and the patient asked to resume the embroidery work he had given up two months previously. He gained 6 lb. during the seventh and eighth weeks of the course.

Radiography showed that the rapid progress of the tuberculosis was arrested after the first fortnight, and films made on April 30, 1948, showed hardening and retraction of the lesions, which were then restricted to the left upper lobe, the other fields having almost completely cleared. The honeycombing in the left upper lobe, noted in January, had given place to clearly defined cavities.

Three weeks after the completion of the course the patient's condition was still very good, with no sign of returning toxicity; and major surgery of the left upper lobe (thoracoplasty or pneumonectomy) could reasonably be considered. But his pyrexia is now gradually increasing, although it is not so high as it was before the course of P.A.S.; there is a slight increase in the number of bacilli per field; the E.S.R. has risen from 8 to 15 mm. in an hour; and the patient has lost 6 lb. in weight.

Case 3.—A man, aged 31, with tuberculous pneumonia and poor resistance, reached a hopeless condition by December, 1947, being very toxic and apathetic, with severe anorexia. He was given penicillin, 6 mega units, after which a sixty-day course of P.A.S. was started on Feb. 29, 1948. Again the improvement in his clinical condition was the first and most striking effect. Cough became much easier, the feeling of tiredness disappeared within a few days, and his appetite rapidly improved. (Five consecutive specimens of sputum were negative for tubercle bacilli.)

Radiography (April 30, 1948) showed much fibrosis of the right apex, with displacement of the trachea, well-marked

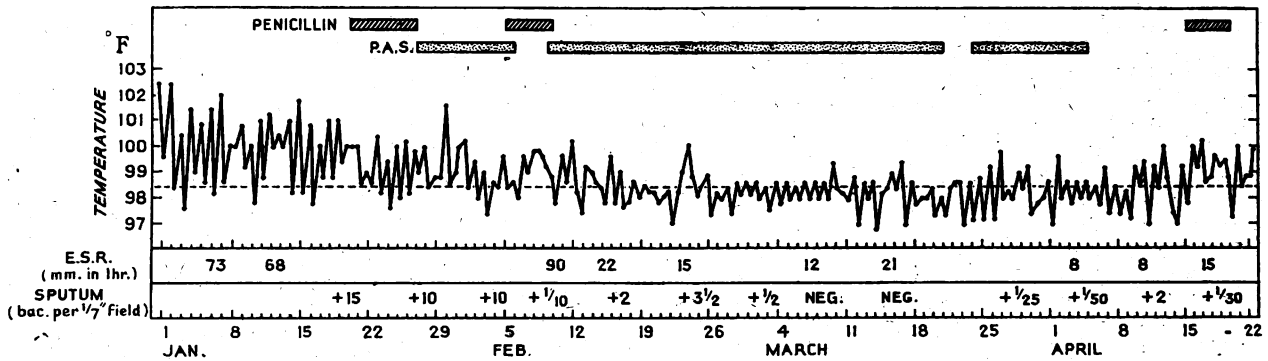


Chart in Case 2.

retraction and hardening of the soft mottling, and clearing of the lung fields.

After five weeks he was given a different preparation of P.A.S., and his temperature rose slightly and settled again. The improvement in his general condition continues.

**Case 4 (Dr. Owen).**—A man, aged 35, was admitted with severe dyspnoea and troublesome cough in September, 1947, but was much less toxic than cases 1-3. He improved on rest in bed by February, 1948, but evening pyrexia and cough persisted. A six-week course of P.A.S., started on Feb. 16, led to a fall in his temperature, disappearance of cough, and great reduction of sputum; but radiologically there has so far been no well-marked change.

**Case 5 (Dr. Owen).**—A man, aged 25, with advancing exudative tuberculosis of both lungs, and in a toxic state. A sixty-day course of P.A.S. led to improvement in temperature, appetite, and cough. Radiography (April 24, 1948) showed contraction of the soft lesions and shrinkage of the cavities.

**Case 6 (Dr. O'Malley).**—A man, aged 28, with a more chronic type of pulmonary tuberculosis with little constitutional disturbance. A four-week course of P.A.S. brought about no dramatic improvement in his condition, which had been fairly satisfactory before the treatment started. There was, however, a considerable fall in the evening temperatures and less sputum, and his vital capacity increased from 3.5 to 4.2 litres. Radiography at the end of April showed contraction of the soft lesions and clearing of the bases.

Five weeks after the end of the course the patient's general condition is still very good; neither the quantity of sputum nor the number of bacilli per field has increased; and the E.S.R. remained at its last and lowest figure; but the patient has lost 5 lb. in weight.

The most striking first effect of P.A.S. was the great improvement in the patients' general condition. This change was most remarkable in the severely toxic, anorexic, and apathetic patients, and was observed usually on the third day. The P.A.S. seemed to reduce both the average level and the swing of the temperature, especially when the patients had also had large doses of penicillin (cases 1-3). The number of organisms in the sputum decreased rapidly, and in all treated cases the bacilli looked granular and tended to clump. An attempt was made to culture the positive sputum of cases 1 and 2 after three weeks on P.A.S. In spite of every precaution to exclude contamination with P.A.S. the cultures showed no growth after six weeks. Further series of cultures, with p-aminobenzoic acid added, also remained sterile. Youmans et al. (1947) have reported that this substance reduces the bacteriostatic activity of P.A.S. to less than a sixteenth.

With a daily dosage of 12 g. of P.A.S. a level of 2-5 mg. per 100 ml. has been reached in the blood. The urine was loaded with salicylates, and one quantitative analysis showed a concentration of 500 mg. per 100 ml. The faeces gave a strongly positive reaction with ferric chloride when P.A.S. was given by mouth, but only a weak positive when the solution of the sodium salt was used. Faint traces of salicylate were also found in the sputum of cases 1-3.

The blood picture was closely watched in cases 1-3, and there was little change in the slight anaemia of these patients. They developed a moderate leucocytosis of

RESULTS OF TREATMENT

	Case 1	Case 2	Case 3	Case 4	Case 5	Case 6
Age (years) .. .. .	19	16	31	35	25	28
Condition .. .. .	Very toxic	Very toxic	Very toxic	Slightly toxic	Toxic	Not toxic
Course (days) .. .. .	60*	60*	60*	60	60	30
Change in weight (lb.) .. .. .	+27	+6	-20§	+18	+12	+7
Sputum: Average fall in daily quantity (oz.) .. .. .	1 1/2 to 1	2 to trace	1 1/2 to 1/2	3 to trace	1 to < 1/2	2 to trace
Average fall in number of bacilli per 1/7 in. field .. .. .	50 to 1/35	15 to 1/35	50 to 0	10 to 1/25	5 to 0	5 to 1/2
Average temperature range (°F): 10 days before course .. .. .	99.2-101	98.4-102	97.2-100	98-100	97.2-99	98-99.4
Last 10 days .. .. .	98-99	98-98.4	97.8-98.6	97-98.6	97.2-98	97.4-98.4
Fall in E.S.R. (mm.) .. .. .	65 to 12†	68 to 8†	32 to 9†	92 to 27‡	76 to 32‡	25 to 10‡
Night sweats .. .. .	Severe, ceased after 5 days	Severe, ceased after 10 days	Severe, ceased in 5 days	None	None	None
Cough .. .. .			Much reduced in all cases			
General condition .. .. .	Very much improved	Dramatically improved	Much improved	Much improved	Very much improved	Improved
Radiological changes .. .. .	Well marked	Well marked	Well marked	Nil	Slight	Slight

\* Penicillin also given. † Wintrobe, corrected. ‡ Westergren.  
§ From the day of admission; most of this was lost before the course of P.A.S. was started.  
|| In case 3, five negative specimens and in case 5 two negative specimens were obtained.



12,000–14,000 per c.mm., with a relative increase in polymorphs, a shift to the left, and a high proportion of monocytes (up to 16%). When P.A.S. was stopped, the proportion of monocytes fell to about 6%. Cases 4–6 also showed leucocytosis, with increase in the number of the polymorphs and monocytes.

#### TOXICITY OF P.A.S.

No toxic reactions were observed in this series. This finding is at variance with the experience of other workers, which again are conflicting. Lehmann (1947) found that P.A.S. killed guineapigs within five days, whereas Feldman et al. (1947) gave P.A.S. to guineapigs for 112 days without any ill effects. Lehmann (1946, 1947) and Vallentin (1947) reported gastro-intestinal symptoms in their patients, and similar complications have been observed by Dempsey and Logg (personal communication). One of the American manufacturers of the drug warns users against diarrhoea and vomiting. The cause of these conflicting reports is probably that the synthesis of P.A.S. is very difficult, and the different makers use different methods. It is thus possible that the toxic symptoms are caused by impurities which remain in some commercial preparations and not by the P.A.S. itself.\* In cases 1 and 2 I substituted for P.A.S. sodium salicylate, made up to look and taste very similar to the mixture these patients were having. After the first two doses of 1.5 g. each the patients had severe vomiting and diarrhoea, and the new mixture had to be withdrawn. The same mixture, however, had no adverse effect on other patients. Possibly P.A.S. increases the sensitivity to salicylic acid.

#### DISCUSSION

Lehmann (1947) believes that P.A.S. is bacteriostatic to *M. tuberculosis* by interfering with the deamination of the amino-acids. Youmans et al. (1947) suggest that, by interfering with the enzyme system of the bacilli, P.A.S. changes the host's tissue reaction from necrotic exudative to fibrotic proliferative.

The present small series suggests that the action of P.A.S. on tuberculous patients is complex. The rapid reduction in the number of bacilli in the sputum, together with the morphological changes noted in them, confirms the bacteriostatic activity of P.A.S. which can be demonstrated in Du Bosc medium on HR37 strain at a concentration of 35 µg. per ml. The rapid improvement in the clinical picture, on the other hand, and the well-marked gain in weight, seem to indicate a direct pharmacological action on the host, and this view is supported by the repeatedly checked changes in the white-cell counts. Further, P.A.S. seems to have a direct antipyretic action; when it is withdrawn, the pyrexia increases and the temperature swings more, though not so much as before treatment. The patients' general condition, however, has so far remained satisfactory, and night sweats, anorexia, and other symptoms of toxicity have not returned. The radiological changes support the view of Youmans et al. (1947) that P.A.S. promotes fibrosis.

I believe that the daily dose of 12 g. we have used is much too low, though it is only slightly below the 14 g. recommended by Lehmann (1947), and in excess of the 10 g. recommended by the American makers of P.A.S. In further trials one should try to push the dose up to 20 g. daily. It may be advisable to give vitamin-B complex as well, in view of the close connexion between P.A.S. and the water-soluble vitamins, and Lehmann's (1947) observation that guineapigs fed with P.A.S. show signs of deficiency of vitamin-B complex. It also seems necessary to extend the course of P.A.S. treatment beyond Feldman's 119 days, until true sputum conversion

has been reached or P.A.S.-fast strains appear. I shall also try inhalation of P.A.S. solution in a fine mist to supplement the effects of the drug by mouth.

#### CONCLUSION

From the present investigation it appears that P.A.S., though it cannot be regarded as a cure for tuberculosis, is very active in the exudative and toxic forms of pulmonary tuberculosis and may prove to be a valuable adjunct to existing therapeutic measures. Owing to the high concentrations obtained in the urine, it may also have a beneficial influence on tuberculosis of the urinary tract.

I am indebted to Dr. W. E. Snell for advice and permission to publish this paper; Dr. J. A. O'Connor for advice on the chemistry; Mr. S. R. Philpot for pathological work; and Messrs. Ward, Blenkinsop and Co. Ltd. for free supplies of P.A.S.

#### Comment

Dr. SNELL

I have closely observed the cases reported here throughout the patients' stay in hospital. They are few, but under *p*-aminosalicylic acid they have all shown a sustained fall in the temperature level from the time of its administration. Clinically their improvement has been most striking. Though one might expect some improvement on psychological grounds, which is often observed when patients know they are undergoing a new form of treatment, I feel that the improvement in these cases was greater than could be explained in this way. Cases 1 and 2 had gone steadily downhill since their admission to hospital, and I had regarded their chances of survival for more than a few months as very poor. All the patients have shown a much improved sense of well-being, improved appetite, and more alert appearance, and the number of tubercle bacilli in their sputum has much diminished.

The duration of treatment has been too short for any real conclusion to be formed, nor can it be decided whether the clinical improvement will persist when the treatment ceases. I feel, however, that the improvement in these few cases is sufficient to warrant an intensive trial of this treatment when adequate supplies are available. An advantage of *p*-aminosalicylic acid is that it can be taken by mouth as an ordinary medicine, and in the dosage that we have given no toxic symptoms of any sort have arisen. If a large-scale trial can be undertaken, it would be desirable that this should be under the aegis of some directing body, so that the conditions of the experiment in different institutions would be uniform and an early estimate could be made of its value in the treatment, particularly, of the acute type of pulmonary tuberculosis.

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“ . . . if it be conceded, against the bulk of the evidence, that a smaller population would be a good thing, the fact still remains that a declining population would be—will be—extremely uncomfortable. It will be an ageing population, carrying a growing load of pensioners on its increasingly middle-aged and stiff-jointed shoulders, lacking new blood, fresh outlooks, the venturesome attitude. It will have to bear the cost of maintaining capital equipment designed for larger numbers. It will offer a fickle and a shrinking market to business men and to planners; it is likely to suffer more, not less, from unemployment. Altogether shrinking pains are worse than growing pains; and even if a population of 35 or 25 millions represented Paradise, the way to it lies through Purgatory.—*Economist*, May 8, p. 750.

\* It is advisable to regard, in clinical use, the different brands of P.A.S. as different drugs, in view of the differences in their chemical structure, their activity, and their bacteriostatic action.

# PYLORIC SPASM SIMULATING CONGENITAL HYPERTROPHIC STENOSIS

REPORT OF A CASE

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THOUGH the textbooks state that the differential diagnosis of congenital hypertrophic stenosis and pyloric spasm rests on the presence or absence of a tumour, and that pure pyloric spasm never gives rise to symptoms severe enough to endanger life, the case reported here appears to be one of pure spasm.

### CASE-RECORD

A girl, aged 6 weeks, with 4 weeks' history of vomiting, was admitted with her mother to the children's unit, Old Windsor Emergency Hospital, on Feb. 5, 1945. She was a first-born child, weighing 7 lb. 14 oz. at birth. Delivery had been normal at full term. Satisfactory 4-hourly breast-feeding had been instituted. There had been some regurgitation of food since birth, and for 4 weeks vomiting immediately after every feed, the food dribbling out. Stools had been infrequent for the last 7 days but were still soft and yellow.

**Examination.**—Weight 6 lb. 15 oz. Slight dehydration. Obvious loss of weight. After a feed the epigastrium was distended, peristalsis was visible, a firm pyloric tumour was palpable, and there was projectile vomiting. Stools very small, yellow, relaxed, and curdy with mucus.

**Treatment.**—Six 3-hourly breast-feeds of 3 oz. and mid-night feed of 3 oz. of half-strength Hartmann's solution; 'Pylostropin' gr. 1/750 (sublingual lamella) 20 min. before five feeds; and daily gastric lavage.

**Progress.**—Vomiting continued after every feed but was never bile-stained. Occasional small green relaxed stools. Gastric residue increased from 0–2 oz. of thick curds.

**Operation (Feb. 10).**—At laparotomy under local anaesthesia, the pylorus looked and felt perfectly normal. There was no sign of tumour, dilatation, or collapse of duodenum or jejunum, or any abnormality in upper abdomen. No surgical treatment was attempted, and the abdomen was closed.

**Postoperative Progress.**—During the next 9 days the child was put back on the breast 3-hourly. As the breast-milk began to fail, the feeds were complemented with half-cream National dried milk. Phenobarbitone gr. 1/8 was given thrice daily. Vomiting persisted and was sometimes

projectile. Stools were still infrequent (every other day), later small and relaxed. Weight was only just maintained with subcutaneous saline 4 oz. on alternate days.

**Bismuth Meal (Feb. 19).**—Almost complete obstruction at pylorus—i.e., typical radiological appearance of hypertrophic pyloric stenosis. After 1½ hours there was still a large residue in stomach in spite of copious vomit. Very little bismuth passed into small intestine, and first and second parts of duodenum appeared very narrow.

**Further Progress.**—Nine 2-hourly 3-oz. feeds daily of breast-milk alternating with Nestlé's sweetened condensed milk, 1 part to 4 of water. Pylostropin given again. March 3: vomiting much less; body-weight maintained without subcutaneous saline; stools 2–4 daily, small, yellow, and digested; gastric residue 2½ oz. daily of very thick mucus and curds. March 5: breast-milk failed; half-cream National dried milk given. March 9: vomits smaller; gastric residue reduced to ½ oz. of fine curds. March 15–25: severe attack of diarrhoea and vomiting due to bilateral staphylococcal otitis media. March 26: both ear-drums healed; stools pasty but 6 small vomits daily; glyceryl trinitrate gr. 1/400 by mouth 5 min. after feeds. March 28: only 2 or 3 small regurgitations daily; 2 yellow pasty stools daily; negligible gastric residue. April 22: feeds gradually changed to full-strength full-cream 'Cow and Gate.' April 29: weight 10 lb. May 6: weight 10 lb. 5½ oz. May 11: bismuth meal.

On May 11 radiography was repeated, glyceryl trinitrate not being given before this feed. Delay at pylorus still very considerable, but more bismuth passed into intestines. Stomach quarter-full after 4 hours. Large bismuth residue found at ensuing gastric lavage. On May 15 a further meal was given, 5 min. after glyceryl trinitrate gr. 1/400. It passed much more freely through pylorus. Stomach almost empty after 4 hours. No residue found at ensuing gastric lavage. Much bismuth passed in stools.

On May 23 the infant was discharged from hospital. Weight 11 lb. 6½ oz. Glyceryl trinitrate gr. 3/1000 thrice daily prescribed.

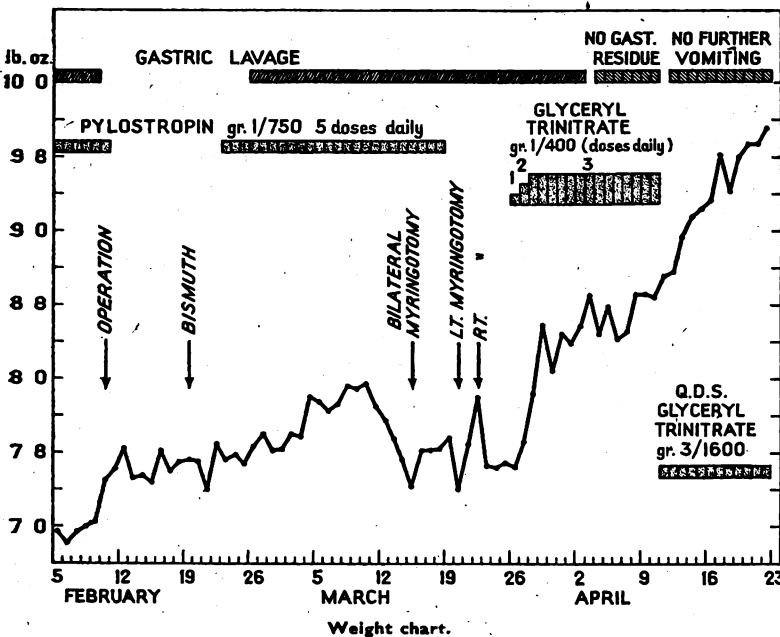
**Progress as Outpatient.**—June 6: weight (clothed) 13 lb. 2½ oz.; glyceryl trinitrate reduced to gr. 1/400 twice daily. July 4: weight 15 lb. 2 oz.; glyceryl trinitrate discontinued.

### DISCUSSION

This case presented as a typical pyloric stenosis. The child had all the classical symptoms and signs (with the possible exception of her sex), and these signs were observed separately by three doctors.

It was our custom to treat medically at first all infants in whom pyloric stenosis had been diagnosed. They all

had daily gastric lavage, some preparation of atropine methyl nitrate (in this case pylostropin), and subcutaneous saline sufficient to correct their daily loss of fluids by vomiting. Only if their condition did not improve during the first week and after correcting any dehydration did we proceed to surgical treatment. In the present case the condition (see figure) did not respond to medical treatment, and therefore a laparotomy was undertaken. To the surgeon's consternation there was neither visible nor palpable thickening of the pylorus; nor was there organic obstruction of the lumen. Stimulated by the success of organic nitrates, as used by Elaine Field<sup>1</sup> in cardiospasm, glyceryl trinitrate was tried. Its effect was immediate and dramatic: the infant gained 15 oz. in three days, and never looked back. It was therefore astonishing that radiography on May 11 showed practically no change from the radiological appearances on Feb. 15; but on May 15, after the third bismuth meal, the therapeutic effects of glyceryl trinitrate were plainly



1. Field, C. E. *Lancet*, 1944, II, 848.

visible. At the age of nine months the child reached the correct weight for her age and was progressing on a normal diet.

We have since tried glyceryl trinitrate for proved hypertrophic pyloric stenosis with no success.

I wish to thank Dr. Charles Pinckney for his criticism and permission to publish this case.

## INTRACEREBRAL CALCIFICATION IN A MICROCEPHALIC

D. CAPPON

M.B. Lond.

*With illustrations on plate*

A Eurasian female baby, aged 9 months, seen in private practice in India, was brought to me by her father, who was worried about the child's listlessness and backwardness. The child was very microcephalic, unable to sit up for any length of time, took little or no interest in her surroundings, and was a weak feeder. Her emotional response, was poor; she hardly smiled or gurgled, and her cry was feeble.

It was difficult to examine the patient satisfactorily, because the parents, who were both Eurasian, were over-anxious and diffident. No stigmata of mental deficiency, telangiectasis, naevi, abnormal pigmentations, or Pringle's facial adenomata were seen, and the child certainly was not blind, though retinoscopy was not done. Nothing relevant was disclosed in the family history.

Radiograms of the skull (figs. 1 and 2) presented a most unusual picture. An abnormally small skull showed a curious pattern of intracerebral calcification, apparently involving mainly the brain substance round the lateral ventricles. Thinking that this might be an unusual manifestation of tuberous sclerosis or of the Sturge-Wever syndrome, I referred the radiograms and notes to Dr. F. Parkes Weber. Meanwhile the patient and her parents and myself were leaving India; so it was impossible to investigate the patient further.

Dr. Parkes Weber writes as follows:

"The radiograms reveal symmetrical calcification in the brain, the exact pattern of which has apparently not hitherto been described. If the two large circles in the anteroposterior view are due to calcification in the walls of grossly dilated lateral ventricles in the child's microcephalic brain, the brain substance must be very deficient in quantity.

"In the differential diagnostic toxoplasmosis must certainly be considered. This disease, when present in infants, causes extensive destruction in the brain and spinal cord; large foci of calcification appear within the necrotic areas; 80% of toxoplasmic infants have internal hydrocephalus, which is either present at birth or develops shortly afterwards; and periventricular infiltration with lymphocytes and plasma cells and ependymal ulceration are often found.

"Unfortunately in the present child the eyes were not examined for chorioretinal atrophy. On the whole, though the pattern of calcification differs from any of the published descriptions, there is much to be said in favour of the diagnosis of infantile toxoplasmosis. Nevertheless, it must not be forgotten that symmetrical cerebral calcification, particularly of the basal ganglia, has been found in other conditions."

"An excellent leading article on human toxoplasmosis in the *Journal of the American Medical Association*<sup>2</sup> furnishes a valuable bibliography."

Efforts are being made to follow up this case and investigate it further.

I am grateful to Dr. Dessa for the radiograms and for the stimulus of interest in the case, and to Dr. Parkes Weber for his comments.

1. Love, J. G., Camp, J. D., Eaton, L. M. *Proc. Mayo Clin.* 1938, 13, 225.  
2. *J. Amer. med. Ass.* 1947, 133, 852.

## Reviews of Books

### Personality and Problems of Adjustment

KIMBALL YOUNG, professor of sociology, Queen's College, New York. London: Kegan Paul. 1947. Pp. 868. 35s.

It is not difficult to credit Prof. Kimball Young's statement that this encyclopaedic book is the product of nearly thirty years' steady revision of a course of systematic instruction. It bears all the evidences of such an origin, except staleness, and it fully realises the author's intention that it should serve as a university text providing an orientation to the interplay of personality, society, and culture: though it may be doubted whether many students will work steadily through so monumental a depository, which, he says, is the outcome of "not only the questions—personal and theoretical—of the students and many others, but considerable clinical experience, extensive examination of the literature and, I trust, some serious thought of my own." If they do, they will acquire an enviably wide and impartial knowledge of almost all the relevant contributions to this crucial subject published before 1941. The book is made up essentially of two parts; the first deals in thirteen chapters with the foundations of personality—physiological, hereditary, and environmental; the second examines how the personality is adjusted to the world's requirements, first at home in the family, then in school and university, in marriage, occupation, and in the organised larger community. Chapters on crime, constitutional deficiencies, and mental disorders lead to a brief consideration of the wider implications of personality in its relation to religion, art, leisure avocations, and the particular society and culture in which we may live. The book enables the reader to set a proper value on the prescriptive claims made by the proponents of some consistent and seemingly complete theories of personality—claims that are often accepted in default of any accessible alternative. Prof. Kimball Young's comprehensive, industrious book affords a larger prospect. It is a useful complement to G. W. Allport's more brilliant and elegant survey, and Murray's more original contributions.

### Kurze Klinik der Ohren-, Nasen- und Halskrankheiten

ERHARD LÜSCHER, professor of diseases of the ear, nose, and throat, University of Basle. Basle: Schwabe. 1948. Pp. 513. Sw. fr. 54.

IN this admirable work a great deal of information is attractively presented in relatively little space. The first section describes the regional anatomy concisely but fully; the second deals with methods of examination; and both are illustrated by clear and well-chosen figures. The third section, on diseases, is meant to be an account of the clinical outlook of the Basle school. As such it is quite impressive and contains little controversial matter. Unfortunately the size of the book has prevented Professor Lüscher from giving fuller accounts of many subjects—such as acute frontal sinusitis, allergy, or carcinoma of the larynx—on which more details would have been welcome. He has a conservative outlook on the surgical treatment of carcinoma, and clearly is impressed by the possibilities of radiotherapy. He advocates chemotherapy in acute infection and emphasises that the drugs must be given early and in full doses or not at all.

### Sexual Behavior in the Human Male

ALFRED C. KINSEY, professor of zoology, Indiana University; WARDELL B. POMEROY, CLYDE E. MARTIN, research associates in the Indiana University. Philadelphia and London: W. B. Saunders. 1948. Pp. 804. 32s. 6d.

STARTED 9 years ago, this must be the most elaborate survey of its subject yet undertaken. When students brought their sexual problems to him, Professor Kinsey often found that there was insufficient information on which to base an answer. To fill the gap he and his colleagues have now produced a work based on the interrogation of 12,000 males of all ages and of every social level. Though not suited to the needs of students, this should be of immense value to those studying problems of sex and fertility, and to sociologists, educa-

tionists, magistrates, and prison authorities. Certainly the minds of most of those called upon to administer the law are none too well informed on the nature of sexuality and on the incidence of the various deviations of sexual pattern. They might be surprised, for example, to learn from this book that in a modern society at least a third of the male population show homosexual leanings. The old idea that male homosexuality is suitably treated by punishment or isolation might therefore be held to require the accommodation in prisons or other institutions of over 6 million males in the United States alone. And even then there would be no reason to believe that the incidence of inversion would be any less in the succeeding generation. It is time that legislation on sexual misdemeanours was revised, and the present survey, made by a zoologist, a psychologist, and a statistician, provides a useful basis of fact. The report, being full of tables and diagrams is not easy reading, but it is realistic.

#### Skin Manifestations of Internal Disorders

*Dermadromes.* KURT WIENER, M.D., dermatologist, Mount Sinai Hospital, Milwaukee. London: H. Kimpton. 1947. Pp. 690. 63s.

DERMATOLOGY, one of the oldest specialties, seems to be turning back from specialisation. Today most dermatologists realise that many maladies long considered to be skin diseases proper are but symptoms of general disorders. Dr. Wiener's work, the first of its kind, focuses attention on the vast range of skin symptoms that are related to, or are a part of, general diseases, and he has succeeded very well in this formidable task. The book, which is easy to read and profusely illustrated, should prove of value both to general physicians and to dermatologists.

#### Color Atlas of Hematology

ROY R. KRACKE, M.D., professor of clinical medicine, Medical College of Alabama. New York and London: J. B. Lippincott. 1947. Pp. 204. 30s.

THIS atlas consists mainly of the plates that have already appeared in the author's textbook on diseases of the blood; in addition there are very brief clinical descriptions of the commoner blood diseases and some equally brief notes on hæmatological techniques.

It is disappointing to find that many of the plates fall short of the necessary standard. The stain used for the preparations is not mentioned, but the appearances are not those of the commonly used Leishman, Jenner-Giemsa, or Wright's stains; the representation of eosinophils on plate 5 suggests Jenner's stain. The cells on plate 9 labelled "megaloblasts" and "macroblasts" show no evidence of the characteristic nuclear patterns of these cells. Other cells have fared equally badly: plate 4 consists of 18 representations of myeloblasts, but the cells have a nuclear pattern resembling lymphoid cells and the fine network arrangement of the chromatin so typical of myeloblasts has been obscured. The megakaryocyte on plate 1 appears little larger than a myeloblast instead of at least five times as large. The monocytes on plate 8 are, however, mostly accurate except for the monoblasts, in which, once again, the proper chromatin arrangement has not appeared. The plates representing various blood-diseases suffer from these faults, which are repeated in them; for instance the "megaloblast" on plate 21—pernicious anemia in relapse—is really a knocked-about normoblast.

The three plates signed by F. A. Baker are quite different. The cells were presumably stained with Wright's stain and would show the typical features of monocytes, myeloblasts, and the cells of infectious mononucleosis if they were well printed. Unfortunately, in the copy submitted for review, these plates (26, 28, and 29) were badly blurred. The text also shows evidence of hasty production. For example, the type of ruling used in the hæmocytometer is not mentioned; auto-agglutination is described as a snag in blood-grouping, but nothing is said of the way to deal with it. Compression of the clinical sections has sometimes been carried too far—e.g., in the attempt to cover splenomegaly and splenectomy in little more than two pages.

We agree that "there is a widespread need for a color atlas of hematology," and we wish this need could have been met more satisfactorily.

*Clinical Studies in Psychopathology: A Contribution to the Etiology of Neurotic Illness* (2nd ed. London: E. Arnold. 1947. Pp. 238. 15s.).—Prof. H. V. Dicks has made little change in his well-known book, which first appeared in 1939. Essentially Freudian in its emphasis on the importance of sexuality and aggressiveness, the exposition stresses also the infantile need for emotional security. The case-histories indicate how regularly perverse sexual fantasies were found to be significant in the genesis and progress of the disorders treated. The author has inserted in the final chapter on the relation of body and mind—towards which he takes the conventional "interactionist" view—a mildly polemical section on the rôle of heredity as cause of mental abnormality.

*Microdiffusion Analysis and Volumetric Error* (2nd ed. London: Crosby, Lockwood. 1947. Pp. 357. 21s.).—It is now some fifteen years since Prof. E. J. Conway, F.R.S., of Dublin, introduced his microdiffusion apparatus to provide a new technique in micro-analysis especially applicable to biological material. Since his first edition came out in 1939 a number of new uses have appeared and the technique has been widely adopted in research and routine biochemistry. In his welcome new edition the author has managed to introduce many of the recent applications, with an increase of only about 50 pages; besides methods using the Conway "unit," he describes microdiffusion techniques evolved by other workers. He has brought his book up to date without affecting its individual character.

*Manual for Hospital Librarians* (London: Library Association. 1947. Pp. 120. 10s.).—The Library Association, which is a national body operating under a royal charter, has coöperated with the Guild of Hospital Librarians—a voluntary association—to produce this little book. Voluntary librarians, as Mr. C. E. A. Bedwell, the editor, points out in his preface, were the first to recognise that the development of the library service for patients demands a knowledge of library technique beyond the range of the amateur. To enable professional librarians to meet this need, the association in 1946 began to grant a certificate for work with hospital patients to those with professional qualifications who pass an examination. The experimental course arranged for the first group of candidates has provided the material for this book, which should be useful to others seeking the certificate.

*The Foundations of Health in Childhood* (London: National Children's Home, Highbury Park, N.5. 1947. Pp. 76. 2s. 6d.).—This is the second of the series of convocation lectures, established some years ago by the authorities of the National Children's Homes. Finding it difficult to define health in "firm and unmistakable terms," Prof. Norman Capon gives in a few well-chosen sentences a clear outline of what it implies, especially in childhood, and then from the antenatal period onwards traces the factors promoting healthy living or responsible for death and disease. A final summing-up on the Attainment of Optimum Health has the sub-headings—home life, happiness, opportunities for growth and development, leadership. These indicate Professor Capon's approach: "full health," he writes, "implies harmony." There is a pleasant sense of harmony in this modest monograph, which can be warmly commended to all those, medical and lay, who have the care of children.

*Wayfarers in Medicine* (London: Heinemann Medical Books. 1947. Pp. 280. 21s.).—This is a collection of essays set out in chronological order and ranging from the medicine of ancient Egypt to that of the present day. Mr. William Doolin writes with a trained pen and with a sure but delicate touch, tracing through the centuries, in its dark days and its triumphs, the slow and chequered story of medicine. Pen pictures of Montaigne and others are a delightful diversion: Mr. Doolin lovingly delineates the career and character of one whom he calls the greatest of essayists, and whose whole life was based upon the Greek admonition "know thyself." Nor does he forget the immense debt we owe to Greek thought in general, and the old Greek habit of direct observation and intellectual inquiry. Full justice is done to the great names of the past, from Mondino, the founder of scientific anatomy, to Pasteur and Lister of our own time. In a book of such erudition it is difficult to particularise, but the chapter on the evolution of surgery is a brilliant exposition.

# THE LANCET

LONDON: SATURDAY, MAY 22, 1948

## Cancer in the New Service

THE passing of the Cancer Act in 1939 was a significant event in the story of medical administration. For the first time the State, through the medium of the local authorities, became responsible for providing effective treatment of a disease outside the recognised infectious or contagious group; and for the first time regional organisation of a treatment service received official approval. The Cancer Act placed on the major local authorities—the counties and county boroughs—the obligation of ensuring, by means of approved schemes, that arrangements were made for the diagnosis, treatment, and follow-up of all patients in their areas suffering, or suspected to be suffering, from cancer; they were not expected to provide these facilities themselves. Within six months of the passing of this Act the country was at war, and the day by which local authorities had to submit their schemes was postponed each year, until the passing of the National Health Service Act in 1946 involved the repeal of the Cancer Act, as from the appointed day, July 5 next.

From its inception in 1929 the Radium Commission, under the guidance of the late G. F. STEBBING, its secretary, has advocated centralisation on a regional basis in the treatment of cancer; and the Ministry of Health drew on the commission's wisdom and experience in devising many of the criteria on which they have based their approval of the numerous and extensive arrangements that local authorities have made for the care of cancer patients. Indeed, the experience of the Radium Commission has no doubt been useful to the Government in planning the regional hospital services. But the new Act will make one big change in the administration of cancer treatment. Before the passing of the National Health Service Act it was possible to link the university centres and the teaching hospitals with the smaller, though no less important, provincial hospitals by means of arrangements made by the local authorities under the Cancer Act. There was no administrative difficulty about this, and the fact that the local authorities could pay the full hospital rate for each of their patients seen or treated often considerably eased the making of these arrangements. After July 5 two other bodies will be involved—the teaching hospitals, which as a part of the universities will retain their autonomy, and the regional hospital boards, which will control the provincial hospitals. Some administrative flexibility will be needed so that a patient requiring special treatment can easily pass from a provincial hospital, which lacks the necessary equipment, to a university or teaching hospital which can provide it. At present arrangements vary in different regions. For example, in some regions there is a fully equipped radiotherapy department at the teaching hospital, where it will be independent of the regional hospital board, whereas in others there is a separate radiotherapy or radium institute

which will come under the board's control. Further, plans have been made, and in some cases carried out, for the establishment of regional centres for neurosurgery and thoracic surgery which will naturally admit some cancer patients. Unless these centres are at teaching hospitals they will be controlled by the regional hospital boards; while much of the highly technical and specialised research—on radioactive isotopes and the like—will be done in the university laboratories with which only the teaching hospitals will be linked. Again, in some regions, as a result of mutual arrangements between the hospitals, the staff of a treatment centre established at a teaching hospital hold regular clinics at several smaller hospitals; in the new service, presumably, such arrangements will have to be made between the regional hospital board, the teaching hospital, and the management committees in charge of the smaller hospitals concerned.

When the new service is working, however, there should be no great difficulty in securing the easy transfer of patients for treatment or in arranging visits of members of the staff of the treatment centre to provincial hospitals for diagnosis and follow-up. The administrative alterations will not, it is to be hoped, involve any change of staff, and visits between the medical staff of the two administrative bodies will continue as before on a basis of mutual understanding and good will. But a generation that never knew the days when separate hospitals worked together as independent units—a generation brought up on a conception of regional hospital boards and teaching hospitals—may forget that a highly centralised organisation on a regional basis made British radiotherapy and the management of cancer in Britain an example to the world. On another page Professor FINCH, of Sheffield, sets out the arguments for a central authority in each region, covering a population of some two million persons, with coöperating centres, some fully staffed and equipped for radiotherapy, others for surgery only; and beyond these a series of consultative clinics within easy reach of the patients they serve. Effective organisation of this kind can reduce the delays in diagnosis and treatment of cases which reach the peripheral clinics. But, as FINCH implies, the ultimate success of the scheme depends on how far the practitioners of the region become integral parts of it, and on how far education of the public overcomes the ignorance, fear, gullibility, and false modesty which are the main causes of procrastination in the face of suspicious changes in form or function.

## Microchemistry of Blood-cell Development

THE standard methods of staining blood and bone-marrow cells, followed with variations and improvements since the time of EHRlich, have led to a wide acceptance of a general view of the development and differentiation of these cells. The primitive cells are large and basophilic; their nuclei are large complex structures containing easily detectable nucleoli, and mitosis is active. As differentiation proceeds the nucleus shrinks, its typical structure becomes either condensed or thinned out, the nucleoli contract, and mitosis is less frequent. Before the bone-marrow cell becomes finally differentiated into the cell that is released into the blood-stream, mitosis

has normally ceased. In the hæmoglobin-containing erythroblasts, the stage of mitotic cessation normally corresponds with the appearance of recognisable hæmoglobin in the cytoplasm; thus in a normal marrow mitoses are still seen in the intermediate basophilic normoblasts but not in the orthochromatic late normoblasts. This scheme is based on reactions to stains under artificial conditions, and it is not always clear how far the appearances are artefacts: It is therefore encouraging to find that modern cytochemical techniques confirm the general correctness of the conclusions drawn from stained and fixed material.

These techniques have lately been applied to blood-cell production by Bo THORELL,<sup>1</sup> of Stockholm. He adopted the ultraviolet microspectrographic technique developed by CASPERSSON, the principle of which is that ultraviolet light of wave-length about 2600 Å is selectively absorbed by the polynucleotides of the cell and the absorption can be measured quantitatively. THORELL also devised a photoelectric method for working in the range of the visible spectrum, because, in blood-cells, absorption at 4047 and 4358 Å is due almost exclusively to hæmoglobin; by this means the appearance and development of hæmoglobin in intact erythroblasts could be quantitatively assessed. The primitive hæmopoietic cells are characterised by having a relatively high concentration (more than 5%) of ribose polynucleotides in their nucleolar apparatus and cytoplasm. While they are maturing this concentration steadily falls to 0.5% or even to nil as mitotic activity in the cells decreases and finally ceases. In the granulocyte series the polynucleotides decline and disappear as the specific granules in the cytoplasm become differentiated, and in the mature granulocyte the nucleoli containing ribose polynucleotide have been entirely replaced by "chromocentra" containing ribose deoxypolynucleotides which react positively with Feulgen stain. Examination of the erythroblasts shows that hæmoglobin formation does not begin until the phase of cytoplasmic protein synthesis, corresponding to the presence of adequate polynucleotides in the cytoplasm, is over—i.e., until the level of polynucleotides is below 0.5%. Then the hæmoglobin content of a cell rises rapidly from something less than  $2 \times 10^{-6}$  µg. to  $25 \times 10^{-6}$  µg., and then more slowly to  $28 \times 10^{-6}$  µg. Thus the life-history of the hæmopoietic cell can be divided into four stages: the stage of growth followed by that of declining growth, and the stage of differentiation followed by that of declining differentiation.

These conclusions were reached by studying normal bone-marrow cells obtained from rats and rabbits, and from man by sternal puncture. Pathological marrow in man has also been studied in a few cases. In acute myeloid and lymphatic leukæmia the primitive cells were found to contain abnormally high concentrations of ribose polynucleotides; these leukæmic cells, instead of showing a rapid decline in polynucleotide concentration like normal cells, actually accumulated polynucleotide. A similar abnormal behaviour was found in the erythroblasts of the marrow in pernicious anæmia; the level of ribose

polynucleotide, instead of falling as maturation proceeded, remained stationary at about 5%, and hæmoglobin appeared and was built up in the presence of this unusually high concentration of nucleotide. An experiment with rabbits showed that in post-hæmorrhagic anæmia there is no such maintenance of polynucleotide concentration and that the only difference from normal erythroblasts was the slow and inadequate development of the cell content of hæmoglobin.

THORELL's techniques may provide the answer to many outstanding problems. For instance, is the persistence of polynucleotide concentration in the presence of developing hæmoglobin content a peculiarity of megaloblasts, or will it also be found in the hæmoglobinised normoblasts that ISRAËLS<sup>2</sup> showed were often present, sometimes in mitosis, in the bone-marrow of patients with chronic hæmolytic anæmias? Why does response to infection produce so many mitoses in the myelocytes of the marrow whose concentration of ribose polynucleotide does not exceed 0.5%; is their nucleotide metabolism also abnormal? The techniques involve complicated and (in this country) scarce apparatus and are not suitable for the inexpert, which is perhaps just as well. Meanwhile those who must still rely on ordinary staining methods can feel assured that they do in fact reflect physiological changes in the intimate chemistry of the developing blood-cell.

## Endocrine and Nervous Influences in Lactation

THE present century has seen a change of emphasis in the field of lactational physiology. Fifty years ago endocrinology hardly existed as a science in its own right; it was not until the 1920's that it began to emerge from the fog of Victorian obscurantism and prudery with which, probably on account of its connexion with sexual phenomena, it had become surrounded. In speculating on milk secretion the physiologists of half a century ago therefore naturally looked on the nervous system as governing the growth and function of the mammary glands. With the rise of endocrinology to a position of respectability and influence, a process which was rapid and inevitable as soon as first-class scientific men turned their whole attention to this field, the situation changed almost overnight. Endocrinologists have since achieved spectacular successes in unravelling the mechanisms responsible for mammary growth and the initiation and maintenance of lactation, and their knowledge, though by no means complete, has now reached a stage where there is prospect of early practical zootechnical applications along such lines as the artificial induction of udder growth and copious milk-flow in barren animals by means of synthetic oestrogens, or the stimulation of milk secretion in animals whose yield is falling off according to the natural laws of decline by the use of galactopoietic agents such as anterior-pituitary extract or artificially prepared thyroid-active proteins. These modern discoveries are also beginning to find applications in clinical medicine. The clinician now uses synthetic oestrogens for the suppression of unwanted lactation and the alleviation of painful engorgement of the breasts,

1. Thorell, B. Studies on the Formation of Cellular Substances during Blood-cell Production. *Acta med. scand.* 1947, 129, suppl. 200. Also published in London by H. Kimpton. 1947. Pp. 184. 5s.

2. Israëls, M. C. G. *J. Path. Bact.* 1940, 52, 361.

though there is some dispute as to how far the lactational suppression—supposedly due to oestrogens—is really ascribable to the removal of the baby from the breast. Moreover, the use of anterior-pituitary preparations and thyroid hormone is being investigated as a means of correcting hypogalactia.

It is hardly to be wondered at that in the general enthusiasm for endocrinology in the lactational field there has been a tendency to relegate neural mechanisms to the background or even to lose sight of them altogether. That the *British Medical Bulletin* symposium on lactation<sup>1</sup> includes a review of this aspect of the subject is a welcome sign of returning equilibrium. And this is an example of a more general trend; for endocrinologists are inevitably moving towards an integration of neural and endocrine mechanisms in respect of phenomena as diverse as mating behaviour, ovulation, lactation, and the general adaptation syndrome. In lactational physiology much confusion has been caused by failure to differentiate between milk secretion and the discharge of preformed milk from the mammary gland. In his review, FOLLEY<sup>2</sup> propounds a terminology which clearly differentiates the various phases of lactation. By its aid it is seen that neural mechanisms are probably concerned both with milk secretion and with events associated with the milking or suckling process.

The neural rôle in milk secretion is envisaged as the calling forth, in response to the stimulus of suckling, of the secretion by the anterior pituitary of prolactin and other hormones which are responsible for the functional activity of the mammary gland and perhaps also for the maintenance of its structural integrity over the lactation period. It is, however, in suckling or artificial milking that the nervous system plays its more prominent part. The problems of lactation do not end with the secretion of milk into the alveolar lumen; milk once secreted cannot, save in negligible proportions, be withdrawn from the gland without the active participation of an expulsive mechanism which squeezes the milk from the alveolar tissues. Such expulsion is widely recognised in agricultural circles, where it is known by the rather misleading term "let-down"; its importance in breast-feeding has been urged by WALLER.<sup>3</sup> This was once believed to occur as a result of a purely nervous and often conditioned reflex, but it has more recently been realised that a neurohormonal reflex is involved, the terminal component of which may be the posterior-pituitary oxytocic factor, which is assumed to cause contraction of "smooth-muscle-like" tissue associated with the alveoli, thus expelling their contents. Some of those best qualified to judge foresee that future investigations will necessitate modifications of this view, but those who, building on foundations laid as long ago as 1911, have brought it forward have at least focused attention on the significance of the milk-withdrawal phase in lactation as a whole. This will stimulate further research into the complex of emotional, neurological, and endocrine factors which must be unravelled if we are to acquire the further insight into the physiology of suckling and milking which is urgently required in the maternity ward no less than in the cow-shed.

1. *Brit. med. Bull.* 1947, 5, nos. 2 and 3.

2. Folley, S. J. *Ibid.*, p. 142.

3. Waller, H. K. *Ibid.*, p. 181; *Lancet*, 1943, 1, 69.

## A Century

1848 was a great year in social medicine. The revolutions in Europe produced VIRCHOW's medical reform movement with its prophetic claim that medicine is a social science. In the City of London JOHN SIMON was appointed medical officer of health. Parliament, forced into action by CHADWICK's classic Report on the Sanitary Condition of the Labouring Population, after years of public agitation passed the first Public Health Act. This Act represented a new stage in English social legislation. It combined the "efficiency" of the Benthamite Radicals with a scheme of genuine reform in the tradition of the Tory philanthropists. Of course there was bitter opposition from the vested interests. But the middle classes were afraid of the cholera, and in Parliament the Bill was largely an agreed measure. With it the modern public-health movement started its campaign, still far from won even at home, to mitigate the horrors of industrialism and to prevent disease where prevention was possible.

The genius of CHADWICK's "sanitary idea"—the basic idea of social medicine—was that the environment could be manipulated and controlled to promote man's well-being. The main problems at that time were the epidemic diseases, particularly typhoid and cholera; and having deduced the association of such diseases with "filth" these early Victorians set themselves to clean up the country. The Act provided for drainage, sewerage, the paving and cleansing of streets, the abatement of nuisances, and the regulation of offensive trades. Local boards of health were to be—or rather could be—set up, and a General Board of Health was established in London to exercise some supervision over them and to make good some of their deficiencies. But in the short run the success\* of the Act was limited. Its powers were too narrow; the necessary administrative apparatus existed neither at the centre nor in the localities. Engineering and medical technique were inadequate, though vital statistics (and the "plain and, sometimes, perhaps, strong language" in which the Compiler of Abstracts commented on them) were already of considerable help. The 1848–49 epidemic of cholera tested the new organisation too early; but what finally defeated the General Board was the controversy over its power to interfere with local rights to do what was needed or to do nothing at all, and over the State's authority to interfere with the liberty of the individual. CHADWICK, overbearing in manner and doctrinaire in spirit, had little sympathy for democratic processes, and in the end public opinion turned him out. The deliverance, however, involved the transfer of SIMON from the City to the Government, and with his quiet and patient work that lacked nothing in courage the foundations of public health were laid.

The achievements of the 1848 Act in the long run, and of its companions and successors in health, housing, industry, and social security, are excellently illustrated in the Health of the People exhibition now being held in London.<sup>1</sup> In the hundred years the population has more than doubled, the death-rate has been halved, the infant-mortality rate has been

1. *Lancet*, May 8, p. 734.

reduced by more than two-thirds, and the expectation of life has risen by over 20 years. The greatest battle of 1848-54, on the constitutional issue of centralisation versus local control, finds little echo today. There has been so much empirical development that it is hard to discern any principle in what is central, local, and now regional responsibility, or to define any limits to social policy except the pragmatic. In this tradition, after prolonged discussion, after another great State paper, and after the inevitable controversy and opposition, the new momenta in medicine and in the ideal of the welfare State have now led to the natural next step in health service, and 1948 finds Britain again the pioneer.

## Annotations

### DISCUSSIONS ON THE ACT

REPRESENTATIVES of the British Medical Association have held conversations at the Ministry of Health, and a meeting of the Negotiating Committee itself—the first since November—was called for Thursday of this week. Next Friday the representative body of the B.M.A. will meet to consider the council's resolution (published in our last issue) which recommends the profession to coöperate in the new service on the understanding that the Minister will continue negotiations on outstanding matters, including terms and conditions of service.

### WELDERS' SIDEROSIS

SINCE 1936, when the now classical paper by Doig and McLaughlin<sup>1</sup> on the abnormal X-ray shadows found in the lungs of electric-arc welders appeared in these columns, many others have confirmed and supplemented their findings. It has been shown that the abnormal shadows are thrown by deposits in the lungs of iron oxide, which is opaque to X rays. The condition is called welders' siderosis, a form of pneumoconiosis which has been classified as benign, because the iron-oxide dust does not set up fibrosis of the lungs and the welders show little or no disability. Further studies by McLaughlin, Harding, and others have revealed that iron oxide when inhaled by workers in other occupations produces similar X-ray appearances with no disabling clinical features. Harding and his colleagues have also produced siderosis in animals with typical X-ray pictures and histological evidence that iron oxide in its pure form does not cause lung fibrosis.

An important publication<sup>2</sup> dealing with the health of arc welders in steel-ship construction in the United States, just received in this country, describes an inquiry into the respiratory health risks of these welders who were working with coated electrodes on bare steel and galvanised steel. In 1943 complaints had been received from people in confined spaces on ships of a condition known as "shipyard cough," "welders' wheeze," or "welders' bronchitis." It has been known for some time that welding fume contains, in addition to iron oxide, irritating gases such as the oxides of nitrogen, concentrations of which can build up during welding in confined spaces, and under such conditions cases of pneumonia and edema of the lung have occurred. When welding is done in open shops little trouble has arisen from this cause. The investigations were made in seven shipyards on the Atlantic, Pacific, and Gulf coasts, and physical examinations were carried out

on 4650 people, about three-quarters of them being welders. Quantitative estimations were made of the fume and gases from welding, including the amounts of iron, lead, zinc, and oxides of nitrogen in the air of the workplaces. Some type of ventilation was provided in all the shipyards, and, though it varied in efficiency, extreme degrees of contamination of the air were not found.

Clinical observations were made on the general fitness of the shipyard workers, and some of the conditions noted, which were possibly related to welding exposure, included a respiratory symptom complex (pharyngitis, rhinitis, and conjunctivitis), arc welders' siderosis, low blood-pressure, and burns by hot slag or molten metal. The incidence and severity of all these conditions were low, and detailed studies of the blood did not reveal any well-marked blood dyscrasias among welders. Gastro-intestinal symptoms were also rare, and under the conditions observed there was no evidence that the inhalation of welding fume predisposed to pulmonary tuberculosis. The low blood-pressures in welders are explained by some writers as due to the oxides of nitrogen which are hydrolysed in the lungs to nitric acid; this in turn reacts with alkalis in the respiratory tract to form nitrates and nitrites, usually of sodium. The nitrites exert their well-known systemic action manifested by dilatation of the arteries, fall in blood-pressure, vertigo, and headache. It is said that this systemic effect is obscured during attacks of acute edema of the lung, which is probably caused by the irritating action of nitric acid on the mucous membranes. In the shipyard inquiry it was found that the mean systolic blood-pressures of welders were lower in each age-group and colour-group than those of non-welders and that this finding had no relation to age. It was observed that in white male welders the mean systolic blood-pressure was lowest in those with less than a year's experience in shipyard welding, and it is suggested that there are pressor or antipressor factors among welders not yet identified. Apparently the nitrite theory is not acceptable to the investigators.

Welders' siderosis was found to be present in 61 (3%) of the male welders and in 10 (also 3%) of those with mixed welding and other exposures. An explanation of this low incidence of siderosis may be found in the fact that only 17.5% of the white male welders had worked at their trade for more than three years. Other investigators have shown that siderosis does not develop until after about ten years' welding. When the work is done mainly in confined spaces the onset of the typical X-ray picture may be more rapid. If the welding fume is removed from the air of the workplaces by exhaust ventilation the condition will not develop at all.

In this issue Dr. Doig and Dr. McLaughlin carry the study of siderosis a step further by showing that the iron-oxide dust can be slowly eliminated from the lungs and that the abnormal X-ray shadows will disappear when the worker gives up welding and no more fume is inhaled. When less welding is done the abnormal shadows will diminish in intensity. (This is in striking contrast with the prognosis in silicosis which may progress even if no more silica dust is inhaled.) These features are illustrated by radiographs of 2 patients, who (as it happens) are the men whose films were published in the 1936 paper. In follow-up examinations of 15 of their original cases it was found that 5 out of 7 men who originally had normal films were still normal; the sixth man of this group showed early and the seventh definite X-ray reticulation. Two men who previously had suspicious changes now had definite X-ray pictures of reticulation. Out of 6 men who had originally shown well-marked welders' siderosis 4 still had the condition on re-examination. All these men had continued to work as welders and had remained in good

1. Doig, A. T., McLaughlin, A. I. G. *Lancet*, 1936, *i*, 771.  
2. Drossen, W. C., Brinton, H. P., Keenan, R. G., Thomas, T. R., Place, E. H., Fuller, J. E. Health of Arc Welders in Steel Ship Construction. Public Health Bulletin, no. 298. Federal Security Agency, U.S. Public Health Service. United States Government Printing Office. 1947. Pp. 200 55 cents.



health. These two papers, based on clinical and environmental observations, together with the work done during the intervening years on the radio-opaque dusts in general, have put the diagnosis of industrial lung diseases and other pulmonary lesions on a firmer basis. The more widely the work becomes known the less often will welders and other workers who inhale radio-opaque dusts be diagnosed and treated for miliary tuberculosis or silicosis on the X-ray findings alone.

### LIVE TO LEARN

EACH of the 25 men and women whom Sir James Marchant has asked to relate *What Life Has Taught Me*<sup>1</sup> has carried away a different lesson from the school-room; for, as Dean Inge points out, life teaches us what we are capable of learning. Miss Margaret Bondfield, for instance, has learnt that to be tolerant of others gives us a chance to do a job of work whole-heartedly, and Bertrand Russell, though he recognises the cruelty of our world, believes firmly in respect for the individual, which he defines as a reluctance to inflict humiliation. Lord Horder admits that he is glad to have attended life's school, for the system of education has appealed to his logical sense; there have been neither rewards nor punishments—only consequences. Above all he has learnt that living is worth while. Miss Margery Fry reminds us that most of us will live longer than we are meant to, and suggests that an alertness to detect life in the individual instead of accepting it in the mass will help us to make good use of our extended span. Mr. E. V. Knox, as befits the editor of *Punch*, records with satisfaction that the people of this country value their sense of humour more than wisdom. The Rev. C. C. Martindale, in a tutorial on the lessons of illness, urges the invalid to be patient with doctors, who are amazingly nice when tamed. Sir William Beach Thomas, who is grateful for his own early knowledge of the deep country, fears that the townsman often has no interest that warms life.

"I speak truth," Montaigne wrote, "not so much as I dare, but as much as I dare, and I dare a little the more as I grow older." Most of the contributors have dared with Montaigne; the bravest have given us the best reading.

### THORACIC SURGICAL SERVICE

THE organisation of hospitals in regions promises particular benefit to the rarer and more complex specialties. As long ago as 1944 the Society of Thoracic Surgeons issued a memorandum in which they argued for a regional service based on well-equipped and well-staffed units whose work should comprehend the surgery of both tuberculous and non-tuberculous diseases of the chest: "members of the society are unanimous in strongly deprecating any separation of the surgical treatment of pulmonary tuberculosis from that of other chest diseases." This is reiterated in a new edition of the memorandum.<sup>2</sup> The way is now open to planning by regions; and, thanks mainly to the coming union of local-authority and other hospitals, it should be possible to end the unnatural estrangement of the two branches of chest surgery. The society hopes to see at least one primary thoracic centre set up in each of the hospital regions. This centre, with perhaps 50-100 beds, should be in, or closely associated with, the teaching hospital; and this should at least contain a unit of 15-25 beds for undergraduate instruction. In most regions secondary units will be needed, while in some regions tertiary units, for minor operations, may be found necessary. The memorandum urges that in London the special chest

hospitals should be adopted as the main centres, which would then help to staff small units in the undergraduate teaching hospitals. Some patients now have to wait two or three years for admission to existing centres; and because the new service cannot match the need, there should be no undue disturbance of present arrangements, particularly for minor operations.

"What is urgently necessary at the moment is to prevent the outcropping, without reference to the general plan, of so-called centres staffed by practitioners who decide to 'take up' chest surgery, when their circumstances neither enable them to serve a proper apprenticeship nor offer them the prospect of an amount of work sufficient to make them competent."

One of the first tasks of units, as they are set up, will be to train further teams; and the surgeons for these must first be well grounded in general surgery. "The work cannot be carried out efficiently by the surgeons or nurses who engage in it as a temporary occupation or who are directed to it when they happen not to be doing something else." The society is convinced that the principal surgeon of each unit should eventually devote himself exclusively to his specialty; he should remain a clinician in active practice; and his emoluments should not be so low as to persuade him that his appointment is simply a stepping-stone to a higher administrative post. This conclusion will be warmly echoed by most clinicians.

### MORE LIGHT ON THE SOUTH AFRICAN "APE-MEN"

IN the year that has elapsed since Prof. W. E. Le Gros Clark, F.R.S., lectured at the Zoological Society<sup>1</sup> on the remains of the fossil ape-like creatures (*Australopithecinae*) discovered by Dr. R. Broom, F.R.S., near Johannesburg, many more remains of the same creatures have been found by Dr. Broom at Sterkfontein. These new discoveries, which were discussed and illustrated by Prof. Le Gros Clark<sup>2</sup> at the Linnean Society on April 22, are very abundant and include at least five more skulls (some unusually complete), limb-bones, including a practically complete *os innominatum*, and several maxillae and mandibles, both mature and immature. Their state of preservation is in some cases extraordinarily perfect, so that minute foramina and delicate sutures in the skull can be accurately defined.

The new material appears to provide emphatic confirmation of some of the main conclusions drawn from the previously discovered fossils, which, though quite extensive, were by no means so perfect. The hominid features displayed by the newly discovered remains are in many respects very impressive. This is particularly the case with the contour of the supraorbital and frontal region of the skull, the very low position of the occipital torus, the disposition of the orbits, the construction of the tympanic region, the shape of the dental arcade, the wear of the teeth, the relatively small canine (which evidently became worn down flat to the level of the adjacent teeth, even in comparatively young individuals), and the forward position of the occipital condyles. This last feature, which is particularly significant, appears to be consistent in all the skull bases now available for study. Of the limb bones, the *os innominatum* is the most remarkable. In the shape of the ilium it corresponds very closely with that of man and shows none of the characters whereby that of the anthropoid apes is distinguished so sharply from the human pelvis.<sup>3</sup> It confirms the inference already drawn from a study of the skull base, femur, and talus—that the *Australopithecinae* stood and walked in approximately human fashion. The additional evidence assembled by Dr. Broom will clearly have an important bearing on the systematic

1. London: Odhams, 1948. Pp. 310. 10s. 6d.

2. Society of Thoracic Surgeons of Great Britain and Ireland: Memorandum on the Provision of a National Thoracic Surgical Service. March, 1948.

1. *Lancet*, 1947, i, 837.

2. *Nature*, Lond., 1948, 161, 667.

3. Broom, R., Robinson, J. T. *Ibid.*, 1947, 160, 430.

position of these creatures. They can hardly be grouped with the modern anthropoid apes, since they lack many of their distinguishing features. Neither can they be accepted as primitive and generalised ancestors of the anthropoid apes, for they present so many features of an "advanced" character (such as the construction of the femur, the human appearance of the os innominatum, the morphology of the skull base, the forward position of the occipital condyles, and several details of their dental anatomy). In any case, it is now known from the fossil apes found in East Africa (particularly those collected by the British-Kenya Miocene Expedition in 1947) that the anthropoid-ape group had *already* undergone some of its divergent specialisations as far back as the Early Miocene (probably at least twenty million years before the Australopithecinae appeared on the scene).

Excavations are still proceeding at Sterkfontein, and much more fossil material will no doubt come to light. Meanwhile, an American expedition, directed by Prof. C. L. Camp, the distinguished palaeontologist, has begun excavations about two miles from Sterkfontein. Two more well-preserved femora of one of the Australopithecines have already been found by Professor Camp, and, according to the press report,<sup>4</sup> these bones provide further convincing evidence that the fossil creatures walked upright. There can no longer be any doubt regarding the main features of the Australopithecinae. They were ape-like creatures with brains of simian dimensions (though their brain-volume was probably rather greater in proportion to their body-weight than in the modern apes), but in the construction of the skull, in the details of the dentition, and particularly in the structure of the limb-bones they show far closer resemblances to the Hominidae than do any of the known apes, living or extinct.

**LATENT DANGERS OF SELENIUM INSECTICIDES**

The observation that plants growing in naturally seleniferous soils are resistant to insect attack has for some time been used as a basis for academic botanical studies. Watering the experimental plants with dilute solutions of sodium selenate to give soil concentrations of 25 p.p.m. or over of selenium has kept them free from aphides and from the red spider mite. Latterly the method has been recommended to commercial growers for the control of the foliar eelworm of chrysanthemums. Full warning has been given of the risks of selenium poisoning if food plants are so treated, but most growers seem unaware of the insidious nature of selenium toxicity and of the hidden dangers they run in using the method. Attention was lately drawn to these potential dangers in a parliamentary question reported in this issue. The questioner mentioned the possibility of sterility arising, as has been observed in insects.

As an example, in recent tests at Long Ashton, wheat, growing in ten-inch pots and watered with sodium selenate solution at flowering, was harvested and to the grain a known number of the weevil *Oelandra granaria* was added. Four weeks was allowed for the weevils to breed, and the original adults, which appeared to be unharmed, were removed. After a further month the offspring in the wheat sample were counted. The wheat from an untreated soil had 344 weevils; that from soil treated once with 50 ml. of 0.1% anhydrous sodium selenate had 124 weevils; that from soil treated twice with the selenate solution had 75 weevils; that from soil treated thrice was free from weevil infestation. Check experiments showed that the sterility of the weevils was due wholly to the selenium treatment.

No direct evidence has been found in veterinary literature that sterility is a feature of selenium toxicity in

animals, though it is recorded that the eggs of hens fed with seleniferous wheat are infertile. In mammals the earlier effects of selenium poisoning, such as the shedding of hair and hooves and the general unthriftiness of the animal, may well mask any sterility effects. The amount of selenium inducing complete sterility in the weevil experiments quoted was equivalent to 20 p.p.m. of soil. But a quantitative comparison may be misleading, for plants differ greatly in their capacity to take up selenium from soil; the cereals in general are poor selenium feeders. The greatest risk however is that selenium, being an element, persists in the treated soil. It is not decomposed as are the systemic phosphorus insecticides, but will remain a persistent source of danger perhaps unknown to the grower, who one day will plant selenium-tolerant food plants in the treated soil.

**PAYMENT OF DENTISTS**

THE Spens Committee on the remuneration of dentists<sup>1</sup> finds that before the war 25% of those between 35 and 54 years of age had net incomes below £450, 50% below £700, and 75% below £1100. Dentistry is exceptionally arduous, and such rates are too low in relation to the value of the services rendered to the community or to the importance of maintaining and improving recruitment to the profession. The committee thinks that a suitable range of incomes would have been attained by doubling those below £400, and adding £400 to those between £400 and £800, with rather smaller increases to those above £800. For the lower incomes these are twice the increments that the previous Spens Committee thought necessary for general medical practitioners, and the resultant ranges may be compared as follows:

	Income at 1939 values		
	75 % above—	50 % above—	25 % above—
Dentists (35-54 years of age) . . . . .	£850	£1100	£1400
Doctors (40-49 years of age, in urban practice)	£1000	£1300	£1600

But the supply of dentists may not be so related to demand as to produce a spread of incomes comparable to that in 1938, and the committee has therefore based its final recommendations on the calculation that an experienced and efficient single-handed dentist, fully employed but not working more than 33 chairside hours a week, should have a net annual income of £1600 at 1939 values. (Various methods of improving on this figure are mentioned, including appointment—mainly on the recommendation of dental colleagues—to whole-time or part-time specialist posts.) The committee thinks that under the previous recommendations a general medical practitioner undertaking the same standard of "full but not unusually heavy work" would command a net income of £1800 at 1939 values. The dentist, it believes, suffers more intensive strain in his chairside work, and a chairside week of 33 hours means in general a working week of some 42 hours. But to earn £1800 the doctor would have to work 50-55 hours a week, and it is far less easy for him to go right off duty. This is held to justify the proposal that the doctor should still receive a rather higher income than his dental contemporary.

THE next session of the General Medical Council will open on Tuesday, May 25, at 2 P.M., when Sir Herbert Eason, the president, will take the chair.

1. Report of Inter-departmental Committee on the Remuneration of General Dental Practitioners (Chairman: Sir Will Spens). Cmd. 7402. H.M. Stationery Office. Pp. 13. 44.

4. Times, May 4, 1948.

Special Articles

TREATMENT OF CANCER

THE PROBLEM OF ORGANISATION \*

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WITH the exception of cardiovascular disease, cancer is the most frequent cause of death in our country and in the United States of America.

The size of the problem is shown by the figures of the Registrar-General's statistical review for 1940, 1941, and 1942 (table I). It is obvious that the methods now available are not being used to their best advantage, and that full use is not being made of the knowledge already accumulated. The results of Mackenzie's (1939) inquiry are given in table II.

The main factors contributing to failures in treatment are as follows:

(1) *Patients do not obtain treatment sufficiently early*—i.e., early diagnosis is not attained. To quote one authority:

"In many instances the diagnosis of cancer may be made with certainty by the general practitioner; in a much greater proportion of cases the opinion of a consultant reinforced by radiological and pathological examination is essential before a possible case of cancer becomes a probable one. Further, in many cases a surgical operation may be needed before a probable case becomes a proved one."

A patient with cancer complains of symptoms which are common to malignant and non-malignant conditions. It has been estimated that for every proved case of cancer five or six patients are suspected of having it. It therefore follows that any clinic required to diagnose cancer must also be equipped to diagnose non-malignant conditions. Patients, therefore, who are suspected of having cancer and are referred to hospital for investigation should pass through the ordinary general medical, general surgical, and specialist departments (outpatient and inpatient) of a general hospital. There should be no ad-hoc diagnostic cancer clinics.

(2) *The treatment given is not always adequate.* The first treatment is the all-important one, and once cancer has

\* Based on a presidential address delivered to the surgical section of the Royal Society of Medicine, 1945. *Proc. R. Soc. Med.* 1946, 39, 231.

been diagnosed the best possible treatment should be obtained. Therefore cancer patients should be treated only by physicians, surgeons, and specialists of the required degree of training and experience, and arrangements should be made whereby those patients whose type of cancer falls within an acknowledged specialty shall be directed to the appropriate specialist, even if it is thereby necessary to refer them to another centre, not necessarily a larger one.

(3) *Sufficient use is not made of past experience.* Experiences are not pooled as they should be. This would be done if there were a central (regional) organisation with coöperating centres. Treatment can be organised on a consultative plane by regular discussions of cases and results. If neither the grievances nor the blessings

TABLE II—EXTENT OF TREATMENT FOR CANCER

Site	No. in sample	No. untreated
Liver	109	109 (100%)
Pancreas	108	107 (99%)
Lung and bronchus	125	119 (95%)
Gall-bladder, &c.	53	48 (90%)
Mediastinum	28	24 (86%)
Oesophagus	134	106 (79%)
Stomach	661	630 (95%)
Intestine	460	425 (92%)
Prostate	110	90 (82%)
Rectum	248	198 (80%)
Bladder	65	46 (71%)
Ovary	94	67 (71%)
Larynx	57	35 (61%)
Miscellaneous	197	113 (58%)
Uterus and vagina	248	110 (44%)
Skin, &c.	78	28 (36%)
Breast	361	117 (32%)
Tongue and mouth	167	48 (29%)
Total	3303	2420 (73%)

of past experiences are remembered too vividly, at least the warnings might be pondered. The history and result of treatment could be sifted scientifically and judged dispassionately.

The main functions of a cancer organisation should be (1) to secure early diagnosis and adequate treatment; (2) to utilise past experience by assessing the results of different methods of treatment (it will never be possible to standardise it); and (3) to plan and direct future treatment by research. Let us consider these functions a little further and how they may be attained.

TABLE I—CANCER DEATHS IN ENGLAND AND WALES

Site of cancer	1940			1941			1942		
	Male	Female	Total	Male	Female	Total	Male	Female	Total
<b>All sites:</b>	33,137	35,605	68,742	33,496	35,478	68,974	34,011	36,128	70,139
Carcinoma	29,470	32,289	61,759	29,711	32,103	61,814	30,214	32,599	62,813
Sarcoma	1321	1037	2358	1361	1029	2390	1265	1148	2413
Glioma (not described as benign)	278	205	483	294	200	494	323	223	546
Undefined cancer	2068	2074	4142	2130	2146	4276	2209	2158	4367
Lip, tongue, mouth, tonsil, jaw, pharynx, palate, cheek, gum, salivary gland	2451	548	2999	2298	525	2823	2216	514	2730
Breast	58	7068	..	63	6956	..	60	7203	..
Uterus: cervix, body, and undefined	..	4402	..	..	4528	..	..	4575	..
Skin	580	440	1020	597	425	1022	549	457	1006
Vulva and vagina	..	428	..	..	458	..	..	473	..
Prostate	2082	..	..	2188	..	..	2388	..	..
Penis	141	..	..	182	..	..	163	..	..
Scrotum	54	..	..	54	..	..	56	..	..
Stomach	7406	5910	13,316	7288	5790	13,078	7105	5552	12,657
Rectum	3539	2250	5789	3649	2309	6958	3698	2442	6140

The sites mentioned in this table are suitable for radiotherapy, except stomach and rectum, figures for which are included for comparison.

## EARLY DIAGNOSIS

Diagnosis at a curable stage can be achieved only by educating both the community and the doctors.

*The Community.*—In the Dominions and the United States this has given rise to much thought and action, with the methods of which all of us may not agree. The criticism will be that any education and propaganda will give rise to innumerable "cancer dread" neurasthenics. One has heard it said: "I dread to think what will happen when the public realise that cancer diagnostic clinics are being established."

Propaganda is not necessary—facts can be supplied, not arguments; but to a public anxious and distressed these facts must be accompanied by hope and encouragement and not merely enlightenment. Morale must be sustained as well as information disseminated. The Ministry of Health has already begun the education of the community with regard to other diseases—e.g., venereal disease—by broadcasting, and posters have been distributed and put where the public are likely to see them. The screen has been used with films such as "Damaged Lives," "Marriage Forbidden," and "Subject for Discussion." The press has been used. Lectures are given by experts in venereal disease.

How much good has been achieved by these methods it is impossible to say, but the effect noted by the medical officer of health of Rotherham in his report for 1938–42 (p. 97) has been (1) "the number of persons suffering from venereal disease who have attended the clinic as a direct result of these efforts has been small; and (2) the number of persons who think they have venereal disease after reading some newspaper article and visit the clinic has increased. Many of these have been worrying secretly for weeks. One must remember the mental disquiet that may accompany such methods."

That education is important is obvious from such facts as that, for example, in cancer of the breast the margin between hope and despair is marked by the involvement of the axillary nodes not merely clinically but also microscopically—on one side of the line 70–90% five-year cures, on the other 30% or much less. This is not propaganda which strays from the path of veracity but actual fact. The axillary nodes are affected in 40% of cases without clinical evidence of their involvement.

Mackenzie (1939) has shown that the patient delays seeking advice owing to ignorance, fear, gullibility, false modesty, or concomitant disease. Mackenzie's figures are given in table III. These causes can and should be removed. How many cancers of the stomach have been buried under mounds of powders, and other cancers under headstones of solidified ointments? The patient should know that cancer is not characterised by any pathognomonic sign or symptom; there is only, as a rule, change in form or function.

The results of educating a community in Georgia, U.S.A., in the treatment of cancer are given by Mackenzie (1945) as follows. There are three periods of delay:

(1) Delay by the patient in consulting a doctor after noticing the first symptom. This delay averaged 6.5 months in 1936, 5.3 months in 1936–39, 4.6 months in 1939–41, and 3.2 months in 1941–44.

(2) Delay between consulting a doctor and visiting a clinic. This also is diminishing.

(3) Delay between visiting a clinic and the start of treatment: 66% of patients start treatment within 1 week, and 90% within 4 weeks.

In 1937 the proportion of definitely malignant cases in those visiting the clinic was 81.2%, whereas in 1942 it was 59.5%. This striking result is due to early recognition of cancer, provision of early treatment, education of physicians, public-health nurses, and laity, and research.

*The Doctors.*—Patients often say they went to a doctor when they noticed a change of form or function in some organ. The breast, for example, had a lump, or there

TABLE III—CANCER PATIENTS WHO REFUSED TREATMENT

Reasons given for refusal of treatment		No. of patients
A	Dislike of hospital, operations by doctor, X rays, radium	94
	Treatment considered useless (death of friends or relations from cancer) .. .. .	10
B	Affraid, weak, nervous .. .. .	9
	Preferred to remain at home .. .. .	17
C	Preferred unqualified aid .. .. .	4
	Domestic and other personal reasons .. .. .	26
D	Age .. .. .	28
	Other disease .. .. .	11
E	No reason stated .. .. .	113
Total .. .. .		313

A = Fear 67%.

was discharge from the nipple. They were told such things as "Don't worry, it's innocent and doesn't matter," or "We'll watch it and see what happens." The golden opportunity is lost. An obvious cancer of the breast is often incurable. Again no examination was made. The most obvious symptom is hemorrhage or abnormal discharge from one of the body openings. "Piles? Who hasn't got piles?" was one remark. "Diarrhoea? Then you're lucky; most of my patients are constipated" was another. "Indigestion at your age? Then take more (or less) whisky," as the case may be. The only inference can be that early symptoms are not known, and especially that early cancer is painless except in bone. The only definite signs of malignancy—fixation and metastases—mean that time is getting on. It is impossible to estimate the natural duration of cancer; indications can only be drawn from statistics, and we all know the strained relations between statistics and truth. Greenwood's (1926) conclusions so drawn for cancer of the breast were as follows:

Age (yr.)	Expectation of life (yr.)
55 A woman with normal expectation .. .. .	13-87
55 A woman with untreated cancer of the breast .. .. .	3-25
55 After operation under average conditions (disease has lasted only a year) .. .. .	5-74
55 After operation under best conditions (disease localised, skin not involved, axillary and supraclavicular nodes not affected) .. .. .	12-93

Halsted (1894) claimed that 75% of patients operated on under best conditions were alive after 3 years.

In the training of medical students attention is drawn to, and the teaching emphasises, differential diagnosis too much. Too little emphasis is laid on biopsy, whenever there is any doubt. The arrangement of cells is the only certain diagnostic test. I am fully aware of Ewing's dictum: "microscopically innocent, clinically malignant," and vice versa. That is where the mature judgment of the teacher should direct the imagination of the taught. The textbooks are also to blame for emphasising the differential diagnosis too much. The student leaves the school with a definite picture of the final stages and a list of innocent lesions in his head. Wishing to give his patient assurance and confidence, he impresses on them that "it is not malignant yet."

The practitioner sees relatively few cases and has little opportunity to improve his knowledge. Hence his training may make him regard as innocent the lump in the breast with no fixation, no retraction of the nipple, no palpable axillary glands. If the practitioner (and he is the first line of defence) had the advantage of attending the diagnostic or consultative clinic, and received a financial sanction for doing so, he would see and realise the difficulty of making an early diagnosis, and his interest would be aroused. The practitioner must be an integral part of any scheme and must be kept informed of the work at the centre and the results obtained.

Apart from procrastination on the part of patients and doctors, delay in treatment may also be due to the

distance from hospital and the expense; to domestic reasons, such as illness of children; or to delay in getting a bed. The case is sometimes entered as an innocent condition, and in the interim the definite signs of malignancy develop.

**AFTERCARE**

The treatment of the cancer patient does not end with the successful operation. There must be a complete follow-up to the very end. The community must be convinced that there is no disgrace in dying of cancer. Appropriate arrangements must be made for the continued treatment of the unsuccessful cases. At present the friends see a painful and perhaps a slow death, and when in turn they are affected they conceal it and hope for the best. "They operated upon So-and-so and did no good; in fact he was worse." Which surgeon has not heard this remark?

Beds must be provided in hospitals or hostels, or alternatively accommodation in so-called almshouses, with adequate institutional and domiciliary nursing, relief of pain, and removal from overcrowded houses. This would do much to hasten an early diagnosis by the patient's seeking early advice and following it. People in the later stages of the disease, who cannot in the ordinary course of events be completely cured, should have all the alleviation which modern treatment can give.

**METHODS OF TREATMENT**

There are only two main methods of treating cancer at present: surgery and radiotherapy, with biochemical treatment looming on the horizon.

Any scheme for the organisation of cancer treatment must provide for diagnosis and adequate treatment by any and all means (surgery, radiotherapy, endocrinology). Treatment must cover not only the primary growth but also all subsequent complications—e.g., relief of pain by surgical procedures, operations on nerves or spinal cord, amputation, &c. Though it is necessary, owing to the

size and expense of apparatus, its immobility, and the essential technical staffs, to concentrate the radiotherapy in comparatively few centres—regional (university) and co-operating centres—the surgery can be done in more scattered centres. Such centres must however be adequately equipped; hence recognition of hospitals rather than surgeons should be the rule. The anomalous position will arise that a surgeon is "recognised as a competent cancer surgeon" at one hospital but not at another, which might be a cottage, local, or small hospital. It is obviously desirable that surgical treatment be carried out on a consultative basis with pathologist and radiotherapist.

The primary consultative centres must be placed near the homes of the patients—e.g., cottage hospitals or health centres. If necessary, consultative centres should be placed in the periphery of large cities or just beyond it. In many cases, to establish a diagnosis all the resources of a large polyclinic are necessary.

There should be an autonomous efficiency and sufficiency in all intermediate and district hospitals, with a smoothly working two-way traffic system, so that patients can go easily to the larger centres, regional or co-operating, and from the latter the team of specialists should be always available to go to the periphery. The accompanying diagram illustrates such a scheme.

**CENTRALISATION**

Centralisation is necessary for the following reasons:

(1) To secure adequate early treatment. It is a recognised fact that in radiotherapy an unsuccessful first treatment often nullifies any subsequent one. Surgeons will agree that the same can be said of surgical treatment.

(2) Radiotherapy apparatus is becoming more and more specialised and more and more costly; so from an economic point of view it must be centralised. When installed it must be used to its full capacity, so that it is not wasted by lying idle, and this means a sufficiency of patients to employ it to its full extent.

(3) The advantage of early diagnosis and early treatment tends to be abrogated if the treatment is not carried out on a consultative plane, because otherwise it tends to be inadequate. The surgery should be done not necessarily at a cancer centre but under the criticism of the centre, and by a surgeon, not a cancer specialist.

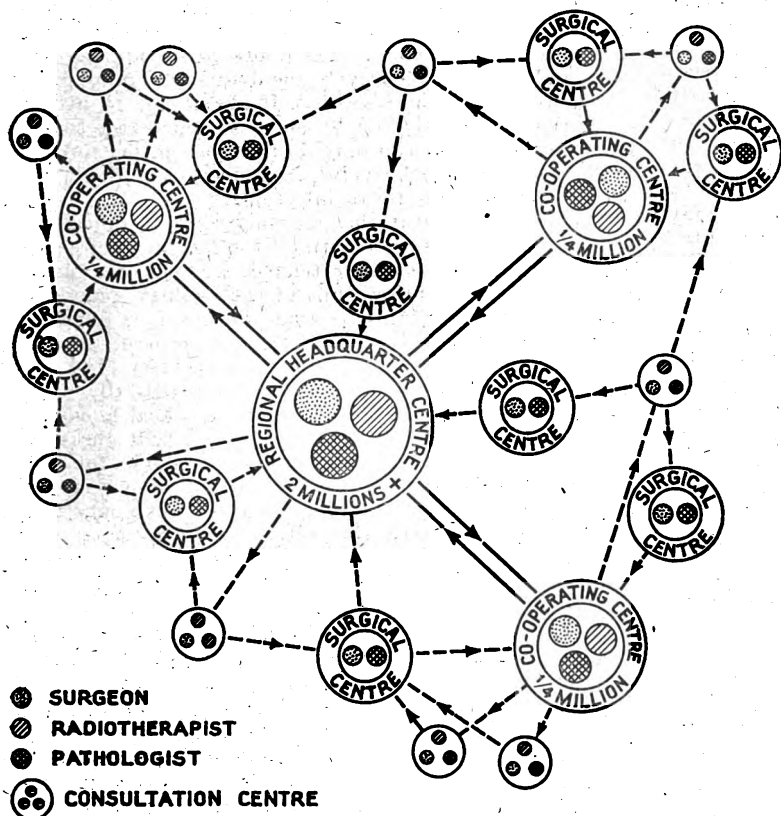
(4) The records at the centre can be kept up to date. Statistical inquiry is now a very specialised subject and needs a properly trained staff. Moreover all cases must be recorded whether treated or untreated. Individual workers have too few cases. A retiring surgeon has usually only experience of a few hundred.

(5) Discussion and assessment of results at a centre should lead to clinical research, apart from the purely scientific research of the biophysicist and biochemist, and adequate treatment thereby attained.

(6) Expert radiotherapeutic technicians are also part of the equipment of the centre, where they can get sufficient experience and deal with the difficult problems.

(7) Finally, the staffs of the regional and co-operating centres could be such that time and leisure are afforded to them to think and ponder.

From all points of view, therefore, it seems obvious that a successful organisation for the treatment of cancer must depend on a regional central authority, with



Suggested plan for a regional cancer service.

coöperating centres and properly run consultative peripheral clinics. The general practitioner must be kept in touch with the results of research and information obtained by the pooling of experience. Thus only can his interest be sustained and ultimate success for the patient be realised.

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## DISTRICT NURSING

## The Future of the Queen's Institute

DISTRICT nurses still practise first, last, and all the time the art of making the patient comfortable. Some 90% of them are trained by the Queen's Institute of District Nursing, the great voluntary body which since Victoria's day has equipped nurses for this special task, and ensured that they maintain a high standard throughout their working life.

## THE TRAINING COURSE

The Queen's Institute has some 44 key training homes, and 56 associate training homes. Only women on the general State register are accepted for training; they take a six-month course, during which they live in one of the training homes and receive a salary. They attend lectures on sociology, public health, and such special nursing subjects as nutrition and dietetics, psychology, hygiene, house planning and sanitation, tuberculosis, and venereal disease; meanwhile they are getting practical training and experience in district nursing, and paying visits to clinics and factories, and to a rural nurse's district. After training, the Queen's nurse works for a year in city or county, as agreed, earning full salary; and at the end of that time she is free. Some return to hospital or take up other branches of nursing, but many continue to work as district nurses. In many areas the committee of the local district nursing association provides her with a car; her work is regularly inspected by Queen's nurse superintendents who give her professional help and advice, and keep her—and her association—in touch with modern developments in the service as a whole.

Selected Queen's nurses or nursing candidates may apply for midwifery training through the institute; and health visitors' scholarships are given annually to qualify nurses for work in areas where public-health duties are combined with district nursing. Midwifery training is arranged at one of the 21 midwifery part II training centres attached to the institute (there are also 36 associated part II training centres), and the health visitor's course is taken at the Brighton Technical College, which, in conjunction with the institute, is approved for this training.

Certificates in both of these subjects are required by those taking senior appointments, as superintendents or assistant superintendents in Queen's training homes or on the staff of county nursing associations. These superintendents need to be experienced administrators, and some of them take senior posts as inspectors on the central staff of the institute.

Hitherto, funds for the important work of training district nurses have been supplied partly by voluntary contributions raised by the local associations, partly by the endowment fund and by gifts and bequests, and partly by affiliation fees of £2 12s. 6d. paid annually by local associations for every Queen's nurse they employ. These fees cover the cost of regular inspection by the institute, and carry other privileges. Thus the institute negotiates with the Ministry of Health and other bodies

on behalf of the associations and gives information from the records about applicants for posts.

## THE NEW PATTERN

After July 5, however, the situation will be changed. The responsibility for providing district nursing will be placed squarely on the local authorities; and though many intend to delegate the task to the voluntary associations, others do not. Where the authority decides to make its own arrangements it will have to consider whether or not it wishes to maintain its connexion with the institute. Some argue that since the authority must supervise its nurses in any case, there is little to be gained by having them inspected by another body.

The situation is particularly complicated in the case of midwives. The Queen's Institute believes that the woman who combines the duties of midwife, district nurse, and health visitor has an important contribution to make, especially in rural areas. In this full rôle she becomes the general-practitioner nurse of the district, to whom people turn in every kind of difficulty; and this is an ideal not to be set aside lightly. The fact that most rural areas have developed their nursing along these lines is perhaps evidence that it is generally preferred by nurses and patients.

Some medical officers of health, and even some nurses, feel however that it is time to separate these three functions. Midwifery is specialised work, and should be undertaken, they hold, by specialists. Professional standards are rising yearly, and in order to excel the midwife must undertake adequate numbers of cases and be able to concentrate on them, undisturbed by other duties. (A very few nurse-midwives, it seems, deliver fewer than 10 cases yearly, in areas which could easily be covered by full-time midwives.) They think, too, that the midwife should be relieved of the need to do septic dressings. Analyses of actual work by nurse-midwives show that a postnatal visit may be sandwiched between the dressing of a whitlow and the treatment of a running ear or a septic bursitis. The more home nursing she does, and the more effectively she does it, the more often will a nurse encounter sepsis. If she is not to attend cases that are considered by some to incur risk to her midwifery cases she can only do that part of her nursing work—perhaps a relatively small part—in which the condition is not due to an infection.

The Queen's Institute has a strong reply to objections against the combining of duties; the incidence of sepsis among midwifery cases attended by Queen's nurse midwives is much below that of the country generally, and the institute maintains that this result is obtained by the careful technique taught and practised. Nevertheless others hold that an unnecessary risk to patients is taken, even though it is successfully overcome. Moreover, the training of the health visitor needs further consideration; it may be that the time has come to plan a rather different course for this important social worker, taking account of her special needs from the very start of her career. It seems that in some areas the nurses themselves favour the separation of the three functions, though in more than half the counties they undertake combined work and prefer it.

## THE NURSING LOAD

Not only the quantity but the scope of district nursing is likely to grow. Though the nurse in some areas gets cases referred to her from hospitals, industry, and public-health departments, in others—as a Peripatetic Correspondent<sup>1</sup> has made clear—she is dealing mainly with the chronic sick. Many people do not pay into the associations; and though no doubt these are generously

1. *Lancet*, April 10, p. 571.

## In England Now

### *A Running Commentary by Peripatetic Correspondents*

cared for when need arises, many do not apply, with the result that the nurse-midwife is doing less nursing than her district really offers. After July 5 it seems likely that more people will seek the opportunity to be nursed at home, and doctors may find it convenient to leave more injections and dressings to district nurses than they do at present. (Certainly the nurses are competent to do much more of this kind of work.) Since they may have more home nursing to do, district nurses may no longer wish to undertake such a vitally important service as midwifery as well. No-one can predict exactly, however, what will be required of them and it may be that the nurse doing combined work will give valuable service for years to come.

A regulation of the Queen's Institute introduces quite a different complication. The institute relies on its inspectors to maintain the standards of practising nurses; but they cannot inspect Queen's nurses employed by a local authority unless the authority choose to become a member of the institute. If her employing body gives up membership of the institute, the nurse becomes an ex-Queen's nurse, gives up her Queen's badge, and is no longer entitled to wear the uniform of the institute. Authorities who might well agree to become members on behalf of their district nurses may be less willing to do so on behalf of their full-time Queen's midwives, who are already being supervised, in a few areas, by competent senior midwives without Queen's training. Also they might conceivably object to paying, on behalf of a full-time midwife, a fee to an institute which is primarily concerned with district nursing. It is not thought probable, however, that authorities will quibble over the membership fees; and in situations of the kind just mentioned they might be given the option of paying some sort of comprehensive fee, covering all their district nurses and midwives, instead of the capitation fee for every Queen's nurse or midwife employed.

#### PROSPECTS FOR THE INSTITUTE

The whole problem is tied up with the future of the institute. The cessation of voluntary support will naturally rob it of a large part of its income; much, however, will depend on the proportion of authorities who choose to affiliate. Four prospects seem to offer themselves. First, the institute, having set this important work in train, might disappear, leaving the task to others. This, it will be generally agreed, would be a very serious loss. Its traditions in nursing are among the highest of any in the country at the present time, and to throw away that incitement to good work would be folly in our present critical state. Secondly, it might be possible to turn the institute into a training school under the Ministry of Health, on a par with the teaching hospitals; but this proposal needs studying and amplifying before its value can be assessed. Thirdly, the institute might become a statutory training body, like the Central Midwives Board, though there are objections to the multiplication of statutory bodies. Finally, it might perhaps become a joint training body with the C.M.B. and the Royal Sanitary Institute; but if the three functions are to be separated in some parts of the country, and if the training of health visitors is to be reviewed, this union would hardly achieve much.

Despite objections, the idea of a statutory body deserves to be considered seriously. Such bodies are sometimes accused of having put the statue into "statutory": in other words they find it difficult to move with the times. But even statues have been known to come to life; and some, like the runaway statues of Dædalus, have proved almost too active. The history of the Queen's Institute is sufficient guarantee of vigour: the country might confidently sponsor a statutory body with such a spirited ancestry.

As a comment on the patient but confused attitude of the long-suffering public, I find my ever-willing but not over-intelligent char's query, "Which doctor shall I register with in July?" very revealing. Doctors, butchers, grocers—all bound by law to provide a certain number of rather dreary necessities to the public.

Does the public expect the doctor's services to count as standard rations or as pointed goods? As I see it, certificates, inoculations, and bottles of medicine will be strictly standard, the demand to be met in accordance with the ration of the day. X rays, blood-counts, more *recherché* medicines, &c., will be on points. There will be a limited variety of items available which will vary in points value in each ration period—for instance, a barium meal will have a high points value and will almost preclude an X-ray film of the chest. How about the little luxuries, such as a course of ultraviolet light or the removal of a mole or *nævus*? These, I suppose, will be in the same category as a chicken—not strictly necessary but very helpful at weekends, and worth paying for through the nose. I foresee a large market in medicine which, if not exactly black, will nevertheless be a darkish shade of grey.

I wonder how our individualists are faring now that team-work is all the rage in modern research? I hope the research monomaniac is being catered for and that he will not be forced to toe the line in some dull mass project or other. How horrible to have one's chief popping into the lab and saying, "We want a methyl group in this compound. Never mind why we want the methyl group; just give us the compound and we will give you fourth—no, third—place in the publication."

It would be interesting to start an Institute of Individual Research. Chaos, of course, would be inevitable, but it would be a mad glorious fruitful chaos. There would be no control over the workers at all. Each would have his own lab and his own assistant and be left to work as and how he pleased. Some would start at 6 A.M. when others would be finishing a stout night's work. There would be no petty jealousies about seniority because all would have the same status. Youth and crabbed age would be on equal terms and the "I-had-to-climb-the-hard-way-and-I-don't-see-why-everyone-else-shouldn't" attitude would be unknown. One snag would be to persuade the staff to stop work. The unrestricted joy of the chase is heady wine; once on the scent your worker is disorientated for time, place, and person and oblivious to all entreaties to down tools and rest. Is all this a pipe dream? Possibly, but if some benevolent millionaire should read these lines, perhaps. . . .

Anyone discontented with his lot should visit the leprosarium on the outskirts of Tokyo. Having seen only one leper previously, I seized on the chance of a visit, arranged through the good offices of our American friends, with considerable clinical avidity. The hour's journey in a new American sedan over the appalling Japanese roads was a luxury compared with the rough travel in a jeep to which we have become accustomed. Bombing and post-war neglect have combined to wreck what few good roads there were in Japan. The leper colony consisted of multiple wooden buildings in the state of unpainted nakedness one now expects in Japan. Over cups of green tea the medical superintendent, through an interpreter, told us that never in the whole of his 25 years in that institution had a member of his staff contracted leprosy, and this he attributed to an efficient antiseptic régime. Out of his 1100 patients he discharged annually an average of 10, but he added that some of these returned with a relapse in later years. There is provision in Japan for 9000 lepers in various leprosaria up and down the country.

In the laboratory we saw the *lepra bacillus*, some very perfect wax models of the skin lesions, and pathological specimens from autopsies. This was all very impersonal, but the horror of the disease which our medieval forebears felt was forced on us when we were taken into the

dingy unpainted wards. Here we saw male and female patients in the same wards, nearly all showing the bloated leonine facies and many the more unpleasant effects of ulceration. One old lady with a severe ectropion and hardly a finger remaining had been an inmate for 35 years. Many patients were hidden under enormous piles of bedding, probably too self-conscious to show themselves. After these wards, of which we saw four or five, each containing 12-16 patients, we visited one of the houses in the grounds for ambulatory cases, where we were introduced to five little girls, all showing ravages of the disease. They greeted us in Japanese fashion on their knees, bowing their foreheads almost to the tatami matting, and as we left a chorus of rather pathetic "goodbyes" followed us.

After paddling our shoes in an antiseptic solution, washing our hands in another, and gargling in a third, we sped back to Tokyo thinking that the man who evolves a successful treatment for leprosy will deserve the thanks of mankind.

The New Look was very evident in Paris—all grades of it, from the most severe and straight-laced corseting downwards (or should one say upwards?). Like alopecia, it can be divided into patchy, partial, diffuse, total, and universal. Sitting at the Café de la Paix, observing the parade of these varieties down the boulevard, several questions pose themselves, as the French say. What, for instance, has happened to the "shifting erogenous zones"? Whither have they shifted? For shifted they have, in no mean way. Almost overnight the bend of the elbow is shrouded again, the shoulders have closed up shop, the knees are plunged into the inner darkness. What compensation has been offered to the psyche in this flight to the newly prepared positions? Perhaps a tantalising glimpse of the ankle may once again throw our primitive emotions into a flutter; and surely the bustle is significant.

Not to be outdone, the Americans have issued a counter-blast—for males, and called the Bold Look. From the pictures in my last copy of *Esquire* it's the real peacock's feathers.

A patient came to me on May 2 with a gunshot wound of the chest which had penetrated the alimentary canal, so that when he drank the liquid came out through the wound of entry. No exit wound was discovered. I ordered small feeds of mixed oatmeal and barleymeal at short intervals, water to drink, and rest and quiet. In less than a week the patient discharged himself fully recovered. Apart from the initial stage of shock, followed by a dazed sort of depression, the chief symptom was diarrhoea, and somebody is going to have a hard job clearing it all away. What? Oh, it was a homing-pigeon shot by some lout with a gun.

It has been said that you will get the best opinion in differential diagnosis by sending a patient up to Examination Hall. On this principle it seemed to me a good opportunity to submit a recent X-ray film of my chest to a number of would-be consulting physicians. The experience was humbling and to some extent nerve-shattering.

Pooling the opinions, I learnt that I had a cavity at the right apex, mitral stenosis, hypertension, aneurysm of every part of the thoracic aorta, probably syphilitic aortitis, bronchial carcinoma, a mediastinal tumour, bronchiectasis, miliary tuberculosis, extreme emphysema, coarctation of the aorta, and pathological fracture of a rib.

As the shadows lengthened I speculated on my future course of action, divided between a jaunty devil-may-care blustering decision to make the most of what might be left to me, and the more sober resolution to put my affairs in order. The sands were fast running out when the last candidate (God bless him) announced that he couldn't see much the matter in the film.

Passing B.M.A. House last week, I saw outside it a notice: THIS IS A BLACK SPOT—LOOK BOTH WAYS. Inquiry shows that this was erected by the St. Pancras borough council, not by Mr. Bevan.

"... So they're still arguing up hill and down dain."

## Letters to the Editor

### IMPROVEMENT OF THE NATIONAL DIET

SIR,—It seems from their report, which you published on May 8, that the nutrition committee of the Central Council for Health Education were not concerned with the effects of the diet on the health of teeth and gums. It is, presumably, well known that dental caries at least is the direct result of civilised diet; experience and experiment have shown that sufficient intake of protective factors, including fluorine, can cause only a limited reduction in its incidence; nor can antibiotics or better tooth brushing be expected to cause a substantial improvement. Conservative dental treatment will long be economically impossible for the bulk of the population, and before condemning them to extractions and artificial teeth it is surely worth considering what dietary reform may be practicable and effective.

Apart from predisposing causes, such as inherited factors and vitamin and mineral deficiencies, the cause of dental caries is the stagnation and fermentation about the teeth of carbohydrates, especially sugars. Such stagnation is due to the eating of softened and refined carbohydrates. It can be prevented by a greater intake of "roughage"—especially raw fruit and vegetables—and by hard and fibrous foods generally. The mastication of hard and unrefined foods keeps the teeth clean, not only by the scouring effect of the fibrous matter but by stimulating a copious flow of saliva and causing movements of the tongue and cheeks. Adequate function also reduces potential stagnation areas by attrition of the teeth and by promoting full development of the growing jaws and the eruption of the teeth into a regular arch. Finally, it stimulates resistance of the periodontal tissues to infection and atrophy.

Although all this is well known to those who have studied the aetiology of dental disease, and is the basis of what dental health education has been attempted, yet it is contrary to a great part of ordinary dietetic and nutritional teaching. Compact foods—i.e., those with a small content of roughage—are commonly considered "nutritious," and the rapid assimilability of sugar is commended while its rapid fermentation in the mouth is ignored. Perhaps this is because the biochemist, in trying to make dietetics an exact science, confines his attention, and sometimes his definition of food, to that part of it which is absorbed into the body. Besides ignoring the hygienic effects of such "food" as is not absorbed, this narrow definition excludes an important independent function of food—its function as a source of pleasure. Such expressions as "moulding the common taste" and "habits sanctioned by generations of custom" show our ignorance of the origins of food habits and of the fundamental causes of their change. Apart from the trend towards variety, which the report mentions, there are two other consistent trends—one towards more softening and refinement of food by cooking and machinery, and the other towards increased sugar consumption. Both trends are closely paralleled by the increase in dental disease. In view of them it is unwise to take it for granted that a rational balance will be approached when foods are more freely available. However much fruit becomes obtainable, cereals will, for as long as we can foresee, be the staff of life, and excessive pure sugar will tend to be consumed with them. The taste for sweetness, as opposed to the actual level of sugar consumption, is not a habit but an elementary fact of physiology which education cannot eradicate.

Health education will be difficult enough when it opposes an instinctive drive, but it must fail if it ignores this factor and recognises merely ignorance, custom, and poverty as the forces opposed to it. Vested interests are also powerful obstructive agents. Another factor, which is frequently neglected, is dental disease; though this is a result of bad food habits it is also a cause of their further degradation. Most of the population suffers from some impairment of masticatory efficiency, and the combined effects of inefficient dentures in the parents and untreated caries in the child often reinforce, at the most impressionable age, the child's preference for soft foods.

Biochemists, doctors, and dentists themselves have been confused by a mass of contradictory and merely



negative statements about the aetiology of dental disease; but much of this confusion springs from the assumption, tacit or explicit, that the defects of modern diet which are ultimately responsible are beyond remedy. Surely the Central Council for Health Education will not accept this assumption?

London, N.W.6.

R. B. D. STOCKER.

SIR,—Your annotation of May 8, based partially on the memorandum of the Central Council for Health Education, raises many important points. As you rightly say, the Chancellor of the Exchequer has made it clear that the pattern of our diet will hardly be changed for some time to come. Our prospects are even more seriously threatened by the fact that the introduction of Western living standards and hygienic conditions into certain European and Middle-Eastern and Far-Eastern countries has been followed by an unexpected and prodigious increase of the world's consuming population. Thus the gap between world production and requirements of food—apart from soil erosion—is steadily growing. The selection of food from available sources and the avoidance of monotony is of great importance, but do we know enough about the many and varied factors involved?

An analysis of the apparently wretched diets of the poorest of the Mexican people revealed a surprising adequacy, or even abundance, of the necessary nutrients in types of food completely unknown in the United States.<sup>1</sup> Meat and dairy products were no part of their diet, which mainly consisted of certain plants growing wild in the Mexican plateau, a special bread, and some inexpensive dried fish. A survey of the nutritional status of 1000 very poor Mexican school-children (the families of these children averaged 5-7 members and the family income about 20 cents a day) revealed the remarkable fact that their nutritional status was superior to that of 760 middle-class school-children in Michigan. The biochemical, biomicroscopical, and hæmatological studies were carried out by the same team of Boston workers in both cases. Other group surveys in Mexico showed also a negligible incidence of detectable malnutrition or deficiencies. This work came as a great surprise to all interested in nutrition and demonstrated that in choosing a well-balanced diet for any people, not only should there be sufficient calories and essential nutrients but the diet should conform with their dietary custom and with the availability of food. In view of these facts the education of the public in food habits appears to be of the greatest importance in the coming years.

Your annotation discusses the great debt the doctor owes to the biochemist but points out that certain aspects of nutritional research have so far been rather neglected because they are difficult to pursue. Most controlled experiments have been carried out on laboratory animals and the results are not easily transferable to man. Many of us will warmly approve your remark that the medical man has a right to express his views on basic nutritional research; I would go a step further and suggest that the doctor should take an active part in nutritional research.

A whole-day conference on the results of recent investigations of nutritional status in Great Britain was held by the Nutrition Society on March 13. One speaker regretted "that none of the speakers had provided any substantial information on the present nutritional status of the country, but had focused their attention mainly on the discussion of methods."<sup>2</sup> The fact is that modern nutritional research has become so complicated that only those familiar with results of recent investigations and with their application are able to express considered views.

Some of the main exponents of nutritional science in the U.S.A. are clinicians (e.g., McLester, Sydenstricker, Jolliffe, Spies, and Wilder), and most American hospitals have not only a physician in charge of nutrition but also well-organised nutritional clinics. Similar nutritional clinics should be established in the teaching and all the larger general hospitals. The responsibilities of dietitians and catering officers should be shared by the physician

in charge of the nutritional clinic. He would be able to maintain a constant interest in nutritional problems at the hospital and instruct not only the students and nurses but also the public through the outpatient department. He would deal with patients with deficiency symptoms, which are not uncommon and are often overlooked. It would be his duty to inform other members of the medical staff about new developments in nutritional research. He would have the knowledge with which to convince the administrative authorities of the need to provide first-class food to patients and nurses. He would also have a unique opportunity to organise and to carry out nutritional research on hospital patients, nurses, and students, which has been, as you say, unduly neglected.

London, W.1.

Z. A. LEITNER.

### INFECTED BURNS OF THE CHEST

SIR,—In the treatment of burns of the limbs the irrigation envelope has many advantages. In view of these advantages a comparable method has been devised for treating the infected burn of the chest or back. In many trades the shirt is the article of clothing which catches fire and the burns are of the chest and axillæ, the limbs and face escaping. With an infected burn the problem of dressings is very real. Daily cleanings and dressings with creams or lotions are both painful and time-consuming, and gauze applied to a burn either sticks if the discharge is serous, or becomes separated from the wound by pus if the discharge is purulent. There is often a mixture of the two, and dressings are offensive and painful to change, requiring anaesthesia. A makeshift "irrigation envelope" does away with these disadvantages.

The burns are thoroughly cleaned under anaesthesia; and large squares of folded gauze are soaked in warm eusol and applied to the wounds. Two catheters, containing two additional holes, are placed with their ends medial to the nipples and their open ends protruding 2 in. above the clavicles. A wad of wool is placed over the end of each catheter and sterile dry gauze is next placed over the chest, wet gauze and wool included. A wad of cotton-wool is placed in each axilla and sufficient gauze is used on the chest to form a thick absorbent cushion without preventing drainage. Sterile jaconet is next placed on the dressings to cover them completely. This is fixed to the waist—an unburned area in cases where the shirt has ignited—by elastic adhesive bandage. A further sheet of jaconet is placed on the back with overlap at the sides sufficient to allow pinning. The neck is fixed with pins and a jaconet vest is thus formed. The patient returns to the ward and is propped up slightly in bed. Eusol is injected 6-hourly by day with an ear syringe down the catheters. After injecting about 40 ml. a pause is allowed before injecting a further amount. The patient feels the solution, which is absorbed by the cotton-wool overlying the catheters' terminal hole. A further injection is made until the patient feels other areas of his chest being washed. The eusol washes between the burn and the gauze and is absorbed by the gauze from within out. Excess tracks off the chest into the axillæ to be absorbed by the cotton-wool there. The discharge of pus is kept away from the burn by the washings, and is to be found evenly impregnating the gauze; owing to the jaconet it does not stain the visible dressings. The most severely burned areas, the pectorals and axillæ, are constantly moist with eusol owing to the placing of the wool. The elastic adhesive bandage round the waist is sufficient to prevent leakage of the small amount of eusol which is not absorbed immediately by the gauze. There is no leakage from the sides if a sufficient gauze cushion and jaconet overlap has been provided.

This dressing can remain for a week in cases of severely infected chest burns. Morale remains high as the patient and his fellows can smell only eusol and cannot see the burn, as in the case of the irrigation envelope. When a change of dressing is required the gauze can be removed without any pain or bleeding from granulating areas.

I have used this method for infected burns with eusol and hypochlorite combined with chemotherapy, and have found it entirely satisfactory.

Aden Protectorate Levies Hospital.

N. J. BLOCKEY.

1. Harris, R. S. *J. Amer. dietet. Ass.* 1946, 22, 974.

2. *Brit. med. J.* April 3, p. 654.

### PENICILLIN THERAPY IN SCARLET FEVER

SIR,—Dr. Jersild must be heartily congratulated on his report (May 1) on penicillin in scarlet fever and otitis. His is one of the first accounts of intermittent high-dosage penicillin therapy to be supported by detailed bacteriological study and follow-up; and he thus provides additional evidence to justify this mode of administration which many of us have been using for some time. My own experience, in two admittedly short series, mirrors his own.

1. At the beginning of 1947, S. Goldwater and I treated each of 30 cases of severe boils and carbuncles with 1 million units of penicillin in aqueous solution, divided into 12-hourly doses of 200,000 units. Extreme shortage of beds forced us to treat these cases as outpatients; yet even the most severe carbuncles were nearly healed within 5 days. At that time we were unable to undertake bacteriological and serological investigations, but the clinical results were so striking that we felt this to be a method worthy of extended trial. Not only was there great saving of beds but patients could return to work much sooner and general practitioners were able to treat similar cases in their own surgeries.

2. Recently, with the coöperation of J. R. G. Bastable, 23 cases of acute tonsillitis and pharyngitis in soldiers have been treated by the same technique. The average stay in hospital has been 5.5 days (range 3–10 days) as compared with an average stay of 10.6 days (range 6–19 days) in patients treated by other methods. In the last 7 cases, where 400,000 units were given 12-hourly for four doses, the average stay has been 4.5 days (range 3–6 days). From 10 cases  $\beta$ -haemolytic streptococci were isolated; 6 were cleared within 24 hours and all within 48 hours.

It was Messrs. Glaxo Ltd. who, in 1946, drew our attention to the fact that a single dose of 200,000 units of penicillin in water gives a bactericidal (as opposed to a merely bacteriostatic) level in the blood-stream. Bigger<sup>1</sup> showed that sensitive organisms were most susceptible to penicillin while in the actively growing phase; this would be about 6 hours after the blood-penicillin level had fallen to zero—that is about 12 hours after a big dose and precisely the time when the next big dose would be given. This theoretical justification for the high 12-hourly dosage is amply borne out by clinical results, and it would appear that there are few infections by susceptible organisms (save those, perhaps, where the organism is protected as in infective endocarditis and pneumococcal empyema) in which 3-hourly, 4-hourly, or even 6-hourly penicillin injections are necessary or even justified.

Royal Victoria Hospital,  
Netley, Hants.

A. MICHAEL DAVIES  
Pathologist.

### ATTACK ON RHEUMATISM

SIR,—“Rheumatology” is a neologism whose claim to admission into our language has scarcely been examined. Time will show if it maintains itself—if it conforms to “one of the requisites of a language adapted for the investigation of truth” which, as J. S. Mill wrote, “is that its terms shall each of them convey a determinate and unmistakable meaning.”

Can anyone tell me what meaning the name “rheumatism” suggests to his mind? If it denotes a syndrome, or a disease, or a pathological process, can he tell me the attributes by which I may know that I am dealing with it; if a class of diseases related by some generic “rheumatic” property, the property; or if a class of diseases unrelated by any essential property, the property that does relate them? Some may say that we are agreeing so to name a class of disorders of the locomotor system, possibly heterogeneous, and so far as we know at the moment related only by the common property of a painful disability of movement, and our ignorance of their causation. Some may feel, as I do, that the “rheumatism” of medical nomenclature should be the “rheumatism” of common speech.

However defined, rheumatism cannot be studied or treated in isolation from somatic disorders of known causation. Those who begin research or practice in departments for the chronic rheumatic diseases will soon discover that they have entered a very wide field of medicine, a broader discipline than that covered by any

possible definition of “rheumatism.” Being a part of the specialty, and probably an indeterminate part, it seems a little pretentious, if not logically impossible, to name the study of rheumatism “rheumatology,” using a form of word appropriate only to a distinct and complete field of inquiry.

London, W.1.

KENNETH STONE.

### ALLOWANCES FOR THE TUBERCULOUS

SIR,—Scales of allowances for the tuberculous were discussed in your issue of April 24. In view of the impending transfer to the State of financial responsibility for tuberculous patients, your readers may be interested in the following information.

My council's health committee has for many years made monetary grants to tuberculous persons and families, and has adopted as a minimum the scale prescribed in the Supplementary Pensions (Old Age and Widows Pensions) Act, 1940. In addition to these minimum grants, the committee makes other weekly grants—e.g., £1 to a patient living alone, 10s. to a patient living as a member of the family, and 3s. 6d. to all contacts. Grants are also payable for medical attention, clothing, extra nourishment, household assistance, funeral expenses, dentures, and surgical appliances. All persons are assisted irrespective of their location or the chronicity of the disease. The patient mentioned in your note, assuming that she had no other income, would receive, if she resided in this county, a minimum income of £2 9s. weekly.

County Offices, Caernarvon.

D. E. PARRY PRITCHARD.

### CARCINOMA OF THE STOMACH

SIR,—It is disappointing that Mr. Hermon Taylor's suggestions (April 17) for the earlier diagnosis of gastric carcinoma have drawn no comments from correspondents.

Some years ago the widow of a patient who had died from pulmonary tuberculosis successfully sued the widow of his doctor who had failed to get an early chest X-ray examination. The annual incidence of serious pulmonary tuberculosis in the middle years of life is under 2 per 1000 per year: that of gastric carcinoma in males aged 65–70 reaches about 2.5 per 1000. The onset of the tuberculosis is masked by the frequency of coughs: the onset of the carcinoma is masked by the frequency of indigestion. If Mr. Taylor's views are correct, the widows of patients dying from gastric cancer might feel justified in suing the doctor who had failed to arrange radiological investigation within the first few weeks.

But would earlier radiography make much difference? I am sceptical. Do gastric carcinomata really develop as rapidly as the history leads us to suppose? Apart from metastases, pain is rarely an early symptom except when either local ulceration of a penetrating tumour leads to the typical neoplastic ulcer, or when the presence of considerable acid leads to most of the neoplastic tissue being digested away so that an apparently benign ulcer results. Obstructive symptoms arise only when the growth abuts on the pylorus or cardia. Loss of appetite and disturbance of motility causing functional indigestion usually occur only when the muscularis is invaded; and noticeable anaemia as a presenting symptom is common only with superficial polypoid ulcerating lesions.

The practical problem is this. A neoplasm of the stomach is found in about 25–50 per 1000 barium meals on patients never previously X-rayed and without a palpable mass. Taking the upper limit of 50, we can imagine that a good (and grossly overworked) radiologist doing 2500 meals a year, 2000 of which are “first” meals, might find 40 obvious neoplasms. He would probably find that in a further 100 patients his diagnosis was tentative, and this group would contain another 40 with neoplasms. He would miss (or be unable to make the diagnosis because of pyloric stenosis or obstruction of the cardia) 10 neoplasms. Finally there would be a group of 100–200 cases in which he would be unable to exclude a neoplasm, and this group would contain the remaining 10 neoplasms. The non-neoplastic cases which cause difficulty are mostly dysfunctions of the pyloric antrum due to simple ulcers, scars of ulcers, and antral gastritis.

1. Bigger, J. W. *Lancet*, 1944, ii, 497.

The effect of earlier radiography would presumably be to cause an enormous increase in size of this last group of "possibles," and their full investigation would cause considerable worry to patients and relatives in return for a very small dividend in lives saved. Supposing that nevertheless we decide to try Mr. Taylor's experiment, further difficulties arise. Without a large profitable experience—i.e., 5000 barium meals followed up clinically—a radiologist tends to be insufficiently firm with his "probable" group, and a little too nervous about his "possible" group. The experienced radiologist, on the other hand, tends to cut his losses and disregard the "possibles." The false positive diagnosis will be brought home to him speedily by the results of laparotomy. The false negative has little effect on his reputation because most cancers in this group seem to develop slowly, and there is the ever-popular defence of ulcers and gastritis turning into cancer.

Whether experienced or inexperienced, the radiologist communicates with the clinician by means of a written report. Different clinicians react quite differently to similar reports by the same radiologist; and different radiologists use the same phrases to express different degrees of probability. Errors of judgment are inevitable until radiologist and clinician get to know each other well, unless either the radiologist becomes a gastro-enterologist and follows up his cases clinically, or the gastro-enterologist is allowed to relieve the overburdened general radiologist and do some of the barium meals. The latter is surely the correct solution. The objections to various special departments having their own X-ray apparatus are overwhelming; the system has been tried and failed. It is, however, farcical to suppose that the D.M.B. is necessary to do screening, or that possession of this diploma means any special knowledge of cardiac or gastro-intestinal physiology. Clinical specialists must be brought into the X-ray department, and radiologists must come into the wards and post-mortem room.

London, W.1.

DENYS JENNINGS.

#### HOSPITALITY FOR GERMAN DOCTORS

SIR,—From Mr. Somerville Hastings's letter of May 8 I see that the invitation to postgraduate courses in this country is to "German doctors" and not to "doctors in Germany."

Why this invidious distinction? Is it not time that hospitality and any possible privileges should be extended to the doctors who have been displaced by the Germans, who alone are responsible for the present plight of these people? These displaced doctors would, I feel sure, appreciate deeply permission to attend courses and once more to mix in normal surroundings.

Lincoln.

WILHELMINA C. MAGUIRE.

#### METABOLITES OF PENICILLIUM NOTATUM

SIR,—It now seems to be generally accepted that the amorphous impure penicillin of earlier days is more potent than the crystalline penicillin G of today. This suggests that the more penicillin is refined, the greater is the loss of unknown metabolites which, being unknown, cannot be measured.

In our work at this hospital since early in 1944 (when penicillin was unobtainable), aseptic, pyrogen-free, penicillin filtrates, known then as 'Vivicillin' and 'Hypholin,' have been injected intramuscularly in the treatment of such diseases as subacute bacterial endocarditis, septicaemia, and meningococcal meningitis. The recoveries which followed could not have been accounted for by the small penicillin content of the filtrate; and this suggests the presence in the filtrate of some unknown, potent antibacterial factors. Moreover, with the filtrate prompt clinical improvement, associated with voluntary expression of well-being by the patient, suggests an antitoxic factor as well.

It is difficult to decide whether we should return to earlier methods of manufacture, but our work suggests that the impure penicillin of earlier days, although more potent than penicillin G, itself lost, in preparation, useful but unknown factors which are present in the filtrate. It would appear that there is scope here for further research.

Wellhouse Hospital, Barnet.

H. ROLAND SEGAR.

#### THE DOCTOR'S WIFE

SIR,—Dr. G. L. Davies is perhaps a little too inclined to argue from the particular to the general; if I understand him rightly, he implies that if only surgeries were habitually empty, how very much easier it would be to spot a serious illness in the casual visitor—particularly if the visitor runs true to type and hides a spectacular disease beneath unspectacular symptoms.

This is undeniable; but luckily the practice of dismissing any patient with a placebo "in the ordinary way" is dying out, and the doubtful case is more likely to be told to report again at a more convenient time.

I maintain, Sir, that the most decisive single factor in determining the type of attendance in surgery is the doctor himself. There is no real difficulty in teaching patients to refrain from coming for things they do not need, provided one is consistent in withholding these and ready to give valid reasons for doing so. This will automatically eliminate the type of patient who does not come to ask for advice, but to give it and to see that the doctor carries it out. Refusal with explanation will either end in his re-education, or it will leave him free to do the round of the local doctors until he tires of it or finds someone who will comply with his wishes. In either case he ceases to be a menace, and it is astonishing how readily he can be brought to heel; but there is one thing the doctor must never do—he must never be betrayed into accepting payment for a certificate which the patient ought to have, even if a complete medical examination is necessary before a decision can be made. With such a reputation the doctor can afford any amount of ruthlessness in cases of imagined hardship, and his surgery will cease to attract people with weak claims, though possibly less weak pockets. If all doctors resisted the wishes of unreasonable patients, the claims of those needing attention would be most fully provided for.

I found during the war that each new restriction or Government order brought its crop of certificate-addicts to the surgery. This afforded an excellent opportunity for mass-education, the effect of which seems to be lasting. I lost several patients who were convinced that they were unfit for fire-watching, for brown bread, for travel by public transport, and other novelties; I spent quite a long time telling them, free of charge, what does and what does not constitute a real disability. I am now on the friendliest terms with them.

My complacency over "certificates" is thus qualified: I am very willing to state that a patient is, in my opinion, unfit for work, in need of additional supplies of milk, or otherwise entitled to preferential treatment; I am prepared to explain to him that this is the definition and the only possible message of a certificate. His ideas about it are very often hazy and wishfully conditioned, but once he understands that a certificate is a statement of medical opinion, and that it is this opinion he has come for, it is quite easy to get him to accept it. I cannot recall ever giving a certificate at the onset of a slight cold, though I am aware that it is often very much quicker to write it, even in triplicate, than to persuade the patient to leave the surgery without it. I would, however, recommend the slow method of persuasion on the grounds that it leaves the patient better informed, and far less likely to make foolish requests again.

Where a certificate is needed, I am inclined to regard it as a necessary part of treatment: to the incapacitated patient it is a matter of deep concern whether his family are or are not provided for. This is so much the case that he is apt to think of his illness almost entirely in terms of certification, and unless one is alive to his anxieties, it is easy enough to be distracted and irritated by it in one's efforts to get him well. From his point of view, the certificate is important; it covers the greater part of his anxieties, and the doctor cannot reasonably complain because he has the power to allay them by a stroke of the pen. The official certificate forms bring the amount of writing to an irreducible minimum, and one should be careful not to confuse one's grievances: it is the number of patients who ask for certificates, rather than the labour involved in writing the needful ones, which evidently gives occasion for complaint. The club certificates are, or were, a tiresome by-product of a faulty system, and one will be only too

glad to see the end of them. On the face of it, the contemplated measure of giving more adequate compensation through official channels seems as good a way as any of attacking this nuisance. "PRACTITIONER."

### BEDS FOR TUBERCULOSIS

SIR,—Dr. Bentley's article of May 8, on the shortage of sanatorium nurses, and how to do without them, will be widely read, and we shall leave the duty of detailed criticism to pens more fluent than ours. But the methods of treatment he hails are those of yesterday, and have failed in and out of sanatorium. The art of cavity closure is not the whole or even the greater part of sanatorium treatment, and we need not tremble for the seduction of the well informed, be they tuberculosis clinicians or administrators. But practitioners who look to such as Dr. Bentley for guidance, yet have seen the excellent progress made by numbers of their patients *when kept strictly in bed while waiting admission to sanatorium*, will be mystified. Circumstances may defeat them, but let neither them nor their colleagues in practice cease to recommend complete rest in bed for patients on the waiting-list; for that offers more hope, when collapse therapy is not indicated, than admission to any sanatorium run, as Dr. Bentley describes it, *à la Suisse*. If his advocacy of exercise in active tubercle gains ground, there will be indeed no need for the indefatigable sanatorium patient to turn his mattress; such views are enough to make mattresses turn in their beds.

W. L. YELL  
R. S. MCDADE.

Chelmsford.

### THE NURSE IN PREVENTIVE MEDICINE

SIR,—It seems to us that Dr. Booth has raised a very important issue. The Working Party on the Recruitment and Training of Nurses, as a result of the tests they undertook, pointed out that some 16% of female hospital nurses are in the top tenth of the population as regards intelligence. It is reasonable to infer that at least as large a proportion of the nurses who work in the public-health services are in that same top tenth.

Health visitors, particularly, add a training in public health to general hospital training; most of them are midwives and many of them hold additional certificates in specialised fields. Yet they are too often used as unskilled labour. Almost every public-health nurse has moments of deep disillusionment and frustration when she realises that only a fraction of her capacity is made use of. It is no question of a desire to be a lesser doctor but a sense of a wide field of public health which cannot be fully tilled unless the brains and knowledge and technical skills of every worker are used to the full.

If, as Dr. Booth seems to think, the scope of public-health nurses will be narrower in the future and not wider, these well-trained professional women will have no incentive to remain in a service where they are not fully used; standards of training will inevitably fall, for the best type of candidate will no longer be forthcoming. It must be remembered that the professions and industry are competing for the group from which these girls come.

With regard to the special case of diphtheria immunisation, it seems incredible that section 28 of the National Health Service Act really means that in future health visitors will be precluded from giving injections in schemes of mass immunisation which will surely still be required. If it does we agree that amending legislation to permit local health authorities to use their staffs to the best advantage is necessary. The National Health Service courts failure from the beginning if children die of diphtheria, who should have been immunised, because the health team may not work as a team.

In our commentary to the Ministry of Health on the Working Party's report<sup>1</sup> we pointed out that the precise duties of any member of a hospital team is largely a matter of convenience, determined by the type of patient, the nature of his illness, the knowledge and experience of available staff, and the ever-changing modes of treatment. This we think is equally true of the team in the field.

We consider that an inquiry into the work of public-health nurses is overdue, both as regards relieving them of duties which could be performed equally well by less skilled workers and maximum utilisation of their ability and special skills.

London, W.2.

THE TEN GROUP.

## Parliament

### FROM THE PRESS GALLERY

#### Allowance for Rehabilitation

IN the House of Commons on May 12 Mr. JAMES GRIFFITHS, Minister of National Insurance, moved the second reading of the National Insurance (Industrial Injuries) Bill, which he explained was intended to remove a defect in the main Act. Rehabilitation was making great strides, and men were being restored to full capability for work after sustaining injuries which only a few years ago would have left them crippled for life. Doctors might therefore be reluctant to certify that a man was likely to be permanently incapable of following his old occupation—at any rate until all the possibilities of rehabilitation had been tried and had failed. That would mean that this section in the main Act would become a dead letter. The Government were adding in this Bill an alternative condition to the condition of permanent incapacity. Thus, if at the end of the first six months during which a man had received injury-benefit he was for the time being still incapable of resuming his old job, the Ministry would be able to grant an allowance for the period while the possibilities of treatment were being considered. Once a man had been found capable of rehabilitation, resuming his old occupation, or taking up one of equivalent standard, he would cease to be entitled to the allowance. The regulations which he would make under this provision, Mr. Griffiths continued, would be submitted to the Industrial Injuries Advisory Council.

### QUESTION TIME

#### Choice of Doctor

Sir JOHN MELLOR asked the Minister of Health why his pamphlet on the new National Health Service contained a paragraph headed, "Choose your doctor now," in view of the inability of executive councils to supply a choice of doctors as promised in the pamphlet.—Mr. ANEURIN BEVAN replied: I need hardly say that a scheme of this magnitude involves an enormous amount of detailed organisation in the background, and if both doctor and patient are to be able to take advantage of the new arrangements as from July 5 it is essential that they help us to make an early start. In view of the increasing number of doctors applying to participate in the service, executive councils should soon have no difficulty in putting in touch with such doctors patients who cannot find one themselves. Sir JOHN MELLOR: Is not this paragraph at the present time completely meaningless, and is the Minister aware that the London executive council are advising inquirers to call again in a month's time, when they anticipate that the difficulties will be removed? Does the Minister share that view?—Mr. BEVAN: I will make inquiries at once to find out whether the London executive council is giving that advice, but I am fairly certain that it is untrue. At any rate, I think that all Members of this House are now anxious that we should facilitate the starting of this Act on July 5, and I hope that hon. gentlemen opposite will be as helpful in this matter as other people are trying to be.

Mr. RALPH ASSHETON: Does the Minister know that, whereas some of the propaganda put forward by his department advises the public that there will be lists of doctors found in the post offices, in fact they cannot be found there at present?—Mr. BEVAN: There will be lists in the post offices and in the town halls as the lists are filled up by the doctors who are applying to join the service. There is obviously some delay among certain doctors at the present time, but they are participating in larger and larger numbers. Indeed, it is to the financial interest of the doctors to get these lists filled up as early as possible. Mr. ASSHETON: The lists are not now in the post offices, and can we be assured that they will be in the post offices?—Mr. BEVAN: As soon as the doctors have indicated their intention of participating in the

1. This commentary was reviewed in THE LANCET of April 10, p. 565.

service their names will be put in the various places indicated in the leaflet. We must have the support of the public and medical profession unless great inconvenience is to be caused to millions of people. Mr. T. E. N. DRIBERG: Is my right hon. friend aware that public-spirited doctors in many places such as Maldon, Essex, have already made public their intention of coming in to help operate this great service, and the only difficulty is that the supply of actual application forms keeps on running out at the post offices because of the enthusiasm of the public?—Mr. BEVAN: I am very glad to hear it, and I will see to it that the supplies of leaflets march with the mounting enthusiasm.

Squadron-Leader E. L. FLEMING: Ought it not to be made clear to the people that when the Minister speaks of people choosing their own doctor, he is referring to general practitioners and not to specialists?—Mr. BEVAN: That is made perfectly clear in the leaflet itself. We are speaking all the while about the general practitioners, and not about specialists and consultants, who are attached to the regional boards and teaching hospitals.

#### The Private Patient and Hospital Services

Mr. G. R. MITCHELSON asked the Minister whether anyone who is the paying patient of a general practitioner not undertaking to provide medical services under the National Health Service Act would be entitled to use the hospital and specialist services available under part II of the Act; what steps should be taken by or on behalf of such a patient if it is found that he requires those services; and in what respect his use of them would differ from their use by a patient who has been accepted by a doctor for general medical services under the Act.—Mr. BEVAN replied: The same hospital and specialist services under the new Act will be available to any patient who requires them, whether he avails himself of general medical services under part IV of the Act or not. Normally he would be referred to these services by his doctor, but he is not debarred from getting them otherwise.

#### Regulations

Sir ERNEST GRAHAM-LITTLE asked the Minister which existing committee fulfilled the request by the Royal College of Physicians, which he promised to consider, for a special procedure by way of a committee to provide a check on the issue of regulations such as would determine the qualifications, remuneration and conditions of service of doctors and dentists under the National Health Service Act, 1946.—Mr. BEVAN replied: I think the present procedure, under which all regulations have to be examined by a special committee in Parliament, coupled with my undertaking to remove from the scope of regulations a full-time salaried general-practitioner service, should be sufficient to remove any apprehension on this point.

#### Hearing-aids

Mr. F. J. ERROLL asked the Minister what provision he intended to make for persons who found the Government Medresco aid unsuitable for their form of deafness.—Mr. BEVAN replied: The electro-acoustics committee of the Medical Research Council is planning research in connexion with a hearing-aid for the very small proportion of patients for whom the Medresco aid is found not wholly suitable.

#### Accommodation for Mental Defectives

Replying to a question Mr. BEVAN stated that on Jan. 1 the number of mental defectives in public institutions was 53,207, and the number awaiting removal to institutions was 3905.

#### National Insurance Contributions

Mr. F. J. ERROLL asked the Minister of National Insurance approximately how much of the weekly insurance contribution, payable by the individual on and after July 5, would be a contribution to the National Health Service.—Mr. TOM STEELE replied: Section 37 of the National Insurance Act provides for lump-sum payments to be made out of the National Insurance Fund to the Exchequer as a contribution towards the cost of the National Health Service. These lump-sum payments are financed by allocating 8½d. out of each weekly National Insurance contribution paid by an employed man and 6½d. by an employed woman. In addition, 1½d. of the employer's contribution is allocated to the National Health Service. In the case of self-employed and non-employed persons the corresponding allocations are 10d. for a man and 8d. for a woman.

#### Staffing of Mental Hospitals

Mr. A. E. STUBBS asked the Minister of Labour if he was aware that the Fulbourn Mental Hospital, Cambridgeshire, were short of staff on the female side; that the number of nurses to run the hospital properly should be 75 female nurses; that the present staff was made up of 32 permanent staff, plus 33 temporary staff who equalled about 16 full-time nurses; and what steps he was taking to help the hospital.—Mr. GEORGE ISAACS replied: The position is substantially as stated. The vacancies at the hospital have been brought to the notice of all nursing appointments offices and the Ministry's liaison office in Dublin. The general shortage of nurses and the reluctance of many persons to enter mental nursing increase the difficulties, but my officers will continue to do their utmost to help the hospital.

Mr. STUBBS: Is the Minister aware that I raised this matter in December last when I was told that it was being given attention at a high level with a view to improvement? Is he aware that the position is now worse? How can the 1000 or more people in this institution get the attention to which they are entitled if there is no staff to look after them?—Mr. ISAACS: The number of full-time nurses is the same, and the number of part-time nurses has increased from 15 to 28. I admit that it is not a very acceptable increase. We are finding people very reluctant to go into mental nursing. We have the European volunteer workers to come in, and we are considering a special arrangement with the Austrian authorities in an effort to get persons who are willing and capable of doing this work.

#### Supplies of Streptomycin

In answer to questions Mr. BEVAN stated that the production of streptomycin in this country was being developed by three manufacturers, and delivery on contracts placed by his department had begun. For the present we were mainly dependent on supplies from the United States. About 15 kg. was now being distributed monthly to certain large hospitals where research is being done in streptomycin treatment of appropriate types of tuberculosis. The number of beds reserved for this purpose matched the supplies of the drug at present available and would be increased as these improve.

#### Sodium Selenate Insecticide

Mr. BARNETT JANNER asked the Minister of Agriculture whether he was aware that sodium selenate insecticide, used by horticulturists in this country, is dangerous to humans, causes the hair to fall out and the nails to drop off, and leads to sterility; and whether he proposed to take any steps to control its use.—Mr. G. A. BROWN replied: I am aware of the toxic properties of sodium selenate. So far as I know, the horticultural use of this chemical in this country has been confined to experimental work, but I am making further inquiries and I am consulting the other Government departments concerned as to what steps are necessary to control its use.

#### Currency for Tuberculous Patients

Mr. DAVID RENTON asked the Secretary to the Treasury whether, in view of the acute shortage of accommodation and facilities in the United Kingdom for the treatment of tuberculosis, he would consider revising the form of certification which doctors were obliged to complete before tuberculosis cases were allowed to go to Switzerland, by making the need for treatment the only prerequisite to certification, so that advantage might be taken of the facilities provided abroad by a larger number of people in Britain suffering from this disease.—Mr. W. G. HALL replied: I regret that it is not possible to provide the unlimited quantity of foreign exchange which this proposal would involve. The Exchange Control Medical Advisory Committee examines all applications for exchange on health grounds and advises whether the medical evidence justifies the provision of currency for treatment abroad.

In answer to a further question, he stated, that of 1317 cases considered by the Exchange Control Medical Advisory Committee since its formation in December last, 22 involving tuberculosis of all types were not considered suitable cases for which currency should properly be provided.

Dr. H. F. BREWER is to represent the British Red Cross Society's London blood-transfusion service at the third International Blood Transfusion Congress which is being held in Turin from May 30 to June 2.

## Medicine and the Law

### Prosecution for Alleged Abortion

THE trial of two women doctors and a receptionist on charges of using an instrument to procure the miscarriage of women patients ended at the Old Bailey last week in the discharge of all three of the accused. Mr. Anthony Hawke, in opening the case for the Crown, explained that operations of this kind, though generally unlawful, are not unlawful if performed for the purpose of preserving the life of the mother. Dr. B., who was said to have illegally used an instrument in the case of four women, had in two of these cases referred the patient first to Dr. F., the other accused doctor. Dr. F., it was said, sent the two patients back to Dr. B. with a certificate that, for reasons indicated, the operation could lawfully be performed. One of the patients, called as a witness for the prosecution, stated in cross-examination that there was hæmophilia in her family and that she told Dr. F. that she had an overwhelming fear of dying in childbirth. The man who was responsible for her condition had two children, one deformed and the other "very peculiar." Dr. B., giving evidence, described the reasons for the operations. In one case there was no pregnancy and she had operated for a quite different condition.

The case against Mrs. E., the receptionist, was that she had assisted Dr. B. in the operations on the four women; it was said that she had received extra pay for this work. The judge ruled that there was not sufficient evidence against Mrs. E. to justify leaving her case to the jury; the prosecution would have to prove that she knew she was taking part in something unlawful; in his view there was no evidence fit to sustain that charge.

Dr. F., who was charged in respect of two women patients, denied the allegations and gave her reasons for advising or taking part in the various operations.

The prosecution drew attention to certain circumstances of suspicion. Dr. B. had performed four operations on pregnant women within five weeks. She had herself said that she had sent "between five and twenty" patients to Dr. F. for her opinion; most of these consultations were on the desirability of terminating pregnancy. One witness said that she was asked to bring Dr. B. a fee of £75 in £1 notes. Dr. B. was questioned about her books which she said she had burned. "What are you going to do in the future," queried Mr. Hawke, "if a woman asks you to terminate a pregnancy? Would you lay the patient on a couch in your surgery and operate with an unskilled assistant standing by?" She replied "I would."

The jury found both doctors "Not guilty."

### Leukæmia and War Service

Mr. Justice Denning's judgment in *Kinkaid v. Minister of Pensions*, reported in the *Times* of May 8, is almost a medical treatise on the doubtful origin of leukæmia. A man died from monocytic leukæmia while still serving in the Army. His dependants were therefore entitled to a war pension unless the Ministry could prove that the illness was neither attributable to, nor aggravated by, war service. In rare cases a war pension has been awarded for a death from cancer. There was the case of Captain Jones who, from a strong sense of duty, refused to report sick although obviously overworked and seriously ill; when at length he was taken to hospital, an inoperable growth was discovered; taking the view that the patient's zeal in remaining at duty was "reasonable" and that the delay in diagnosis and possible treatment had aggravated the illness, the court awarded a war pension to the widow. There have been other awards of pension in cancer cases where there was not enough evidence for the Ministry to discharge its obligation of proving non-attributability or non-aggravation or where the man concerned had been exposed to radioactive substances in his work. The result of the expert medical evidence on which the Kinkaid judgment was founded is that the material facts in one leukæmia are usually indistinguishable from those in another, and that the consequences are the same. It follows

that leukæmia is finally established for the purpose of war pensions claims as a disease not attributable to, or aggravated by, war service.

Leukæmia, said Mr. Justice Denning, is cancer of the blood. A healthy man is suddenly struck down for no apparent cause and dies. The evidence of Sir Lionel Whitby indicated that the circumstances in which this disease arose or developed were the same as with other cancers. The court was furnished with an impressive report and statistics by Dr. Dixon, who explained that in the last nine months an international committee of experts had removed leukæmia from the classification of diseases of the blood-forming organs and had placed it among the malignant neoplasms. Dr. Dixon reported that, though the ætiology of leukæmia was unknown, experience, trial experiments, and statistics made it possible to state confidently that it was:

"not caused or hastened by trauma (except in rare cases of intolerable exposure to radioactive substances), infection, diet, climate, exposure, physical and mental strain or stress. It is not infectious or contagious and is not conveyed by eating or drinking contaminated food or drink. No previous illness predisposes to it."

The conclusion from this expert testimony was that Mr. Kinkaid's death from acute monocytic leukæmia was due to natural causes and would have occurred at the same time had he never been in Army service. The onus of proof resting upon the Minister of Pensions had been discharged beyond all doubt, and this decision will dominate all future claims where death is due to leukæmia.

## Public Health

### Travel to the U.S.A.

THE regulations of the United States Public Health Service require that each person entering the U.S.A. shall present a smallpox vaccination certificate showing that vaccination has been done not more than three years before arrival, and including a note on the reaction observed. These regulations apply to all travellers, including Government officials and diplomatic officers. Failure to present a valid certificate renders the traveller liable to vaccination on arrival or a period of observation (isolation). Travellers are advised to obtain an international form of certificate which, when completed, gives the information required by the U.S. authorities.

### Aircraft Regulations

The Minister of Health announces (circular 74/48) that Eire is now included among the areas excepted from the terms of the Public Health (Aircraft) Regulations, 1948.<sup>1</sup>

## Appointments

ENSOR, G. F., M.R.C.S., D.O.M.S.: asst. county M.O. for ophthalmic work, Essex.  
 HAY, C. P., M.D. Edin., M.R.C.P.E., D.P.H.: asst. senior M.O., East Anglian regional hospital board.  
 HILL, J. L., M.B. Belt, D.P.H.: asst. county M.O. and M.O.H., Eton rural and urban districts.  
 LOWE, J. J. H., M.D. Durh., M.R.C.P., D.P.M.: regional psychiatrist, Leeds regional hospital board (region 2).  
 ROBSON, H. E., M.B. Durh.: orthopaedic surgical registrar, Hartlepool Hospital.  
 ROGERS, K. B., M.B. Lond.: clinical pathologist, Children's Hospital, Birmingham.

### London County Council Mental Health Services:

Asst. M.O.'s:

DONNELLY, JOHN, M.B. Lpool: Cane Hill Hospital.  
 ENGLER, MARKUS, M.D. Vienna: St. Lawrence's Hospital.  
 HUGHES, A. L., M.B. Aberd.: The Manor.  
 KRAMBACH, REINHARD, M.D. Leipzig, D.P.M.: Claybury Hospital.  
 KRUGER, JOHAN, M.D., B.Sc. Amsterdam, M.R.C.O.G.: Banstead Hospital.  
 RICH, E. J., L.M.S.S.A.: Claybury Hospital.  
 ROBINSON, H. H., B.A., M.B. Dubl.: St. Ebba's Hospital.  
 SILVESTER, T. ST. J. H., M.R.C.S.: Bexley Hospital.

### Joyce Green Hospital, Dartford:

First assistants in neurosurgical unit:  
 NORTHCROFT, G. B., M.R.C.S.  
 MCCAUL, I. R., M.B. Glasg.

## Notes and News

### MEDICAL PHOTOGRAPHIC EXHIBITION

THE Royal Photographic Society's medical group has arranged an exhibition which will be on view at the Royal Society of Medicine between May 24 and 29. From nearly 500 entries by 85 photographers the judges have selected 150 prints, 75 transparencies, and 6 films and filmstrips. The exhibition, which may in future be held each year, is planned to show doctors what they may expect from medical photography, and it should also help to raise the standard of photographic work.

Formerly medical photography was treated by the Royal Photographic Society as within the scope of the scientific and technical group; but in April, 1946, under the guidance of Mrs. Rodney Maingot, a separate medical group was formed, with Sir Cecil Wakeley as chairman. The group now has 153 members, who share their experience by circulating portfolios among themselves.

### CHELSEA CLINICAL SOCIETY

THE annual dinner of this society's 51st session was held in London on May 11. Proposing The Society, Sir Walter Monckton, K.C., suggested that soon doctors would have to think "not how to preserve us but which of us to preserve." In his reply, Dr. Neil Maclay, the retiring president, referred to the growing membership, and congratulated members on abjuring medical politics within the society. Sir Leonard Stone, K.C., replied to the toast of The Guests, proposed by Mr. Ivor Back. Mr. Nils Eckhoff was installed as the new president.

### "YOUNG WORKERS AT MEAL TIME" 1

AN inquiry by the London Council of Social Service into the diet of young workers was begun in 1947. The results of the study, which was guided by Mr. F. Le Gros Clark, have now been published, and show that most of the young people questioned have a pattern of six meals: breakfast, mid-morning snack, midday dinner, a cup of tea at 4 o'clock, high tea at 6 o'clock, and supper at about 9 o'clock. A group of 56 young people—38 boys and 18 girls—in an engineering works conformed to this pattern. Breakfasts varied, but usually consisted of porridge, bubble-and-squeak, or spread. The mid-morning snacks were often sandwiches of cheese, meat, or paste, taken with a cup of cocoa; a Friday dinner was usually the main meal of the day. Few ate with their cup of tea at 4, but high tea at 6 included beans-on-toast or some such dish, unless the family custom was to take a light midday meal—in which case tea was the main meal. Supper for most of them was a sandwich or cake and a drink, usually cocoa, but about a quarter went in for sausages, or baked beans and fried potatoes. The report suggests that, since we are in no position just now to supplement the young worker's diet with milk, the habit of the snack meal should be studied carefully. It evidently corresponds to some physiological need: and this may possibly be an effect of carbohydrate excess in our diet. A Peripatetic Correspondent<sup>2</sup> recently reported that on reaching America, the land of plenty, he found he soon gave up his snacks without a struggle. Meals with a high-fat content not only stayed his stomach but reduced his middle-aged spread.

### THE DOCTOR AND THE OLD PERSON

"THAT'S due to old age. There's nothing we can do for it," remarked a teacher of medicine in the 'eighties. One of his students, I. L. Nascher, was so shocked by the remark that when he qualified he collected material for the first important textbook on old age. His *Geriatrics* was published in 1914, and after a slow start study of the disorders of old age is at last gaining momentum.

Dr. Trevor H. Howell tells this story in a special "old age" number of the *Medical Press* (May 5), and goes on to describe the approach to old patients which is most likely to yield results. Attention and observation are the key-words: "The first point for a doctor to note when meeting an aged patient," he says, "is the functional ability." It is

not, in short, what the old person has wrong with him which counts, but what he can do in spite of it, and how much more he can be helped to do by judicious treatment. In case of acute illness "treatment must be prompt and thorough," for severe illnesses upset the delicate equilibrium of the circulation, and once this happens the patient goes downhill. Dr. Howell has already pointed out that the rise of temperature on the first day of an illness may be missed because 98.4°F is considered normal. In most old people the normal temperature range is between 95°F and 96°F (*Lancet*, April 3, p. 517).

He groups the chronic complaints of old people as incurable, treatable but not curable, and curable; and it is noteworthy that he puts only two kinds of disorder into the first class—advanced cancer and senile dementia. In the second class come chronic arthritis and bronchitis, many cases of hemiplegia, hypertension, and the early stages of heart disease. The third class includes infections of the urinary tract and lung, and many minor disorders. He finds that, like babies, old people are surprisingly tough; they can stand more drastic treatment than might be expected, and in particular take major operations well. The great thing to avoid is stagnation. If old people are allowed to lie in bed they "degenerate, develop contractures, get bedsores and literally rot to death." Treatment must often go on for a long time before an old person begins to respond. The doctor must be patient, persistent, and resourceful, and the good doctor gets good results in the long run. "Geriatrics is no specialty for the young man in a hurry."

### University of St. Andrews

Dr. A. E. Ritchie, lecturer in physiology in the University of Edinburgh, has been appointed to the Chandos chair in physiology.

Dr. Ritchie, who graduated in arts and science in the University of Aberdeen in 1936, took his medical degree at Edinburgh in 1940. The following year he was awarded the Ellis prize in physiology, and in 1943 the Gunning Victoria Jubilee prize. He has also held a Carnegie research scholarship, and in 1945 he received the gold medal for his M.D. thesis. Dr. Ritchie is the author of the section on electrical reactions in *British Surgical Practice*, and he has published papers on the electrical diagnosis of nerve injury and on the physiology of peripheral nerve injury.

### Royal College of Surgeons of England

At a meeting of the council of the college held on May 13, with Sir Alfred Webb-Johnson, the president, in the chair, a diploma of fellowship was granted to D. R. Urquhart, and diplomas of membership to A. J. De Villiers, O. A. N. Husain, and Margaret N. A. Tew.

The late Mr. F. F. Burghard, consulting surgeon to King's College Hospital, has left the residue of his estate of £75,000, subject to a life interest, to the college to grant fellowships in surgical science.

### Royal College of Obstetricians and Gynaecologists

On Friday, June 11, at 2.15 P.M., at 58, Queen Anne Street, London, W.1, Dr. N. C. Louros, professor of obstetrics and gynaecology in the University of Athens, will speak on Accelerated Painless Labour. Admission is by ticket, obtainable from the secretary of the college.

### Genetics of Cancer

The Genetical Society of Great Britain and the British Empire Cancer Campaign are holding in London next month a symposium on the genetics of cancer. The subjects for discussion include: Inheritance of Cancer in Man and Animals; Virus- and Carcinogen-induced Mutations. The meetings will be held at 1, Wimpole Street, and 11, Chandos Street, W.1, and further information may be had from Dr. R. R. Race, Lister Institute, Chelsea Bridge Road, S.W.1.

### A New Form of Occupational Therapy

The Goldsmiths Company are holding a conference at their hall in Foster Lane, Cheapside, London, E.C.2, on Friday, May 28 at 2 P.M., to show the possibilities of simple jewellery manufacture and metal work in occupational therapy. Patients of average ability can be taught to use simple apparatus and available material effectively while still in hospital and recovering from illness. In considering this curative and diversionary therapy the conference is not concerned with training patients to earn their living in this craft.

1. Published by the National Council of Social Service for the London Council of Social Service, 29 Bedford Square, London, W.1. 1948. Pp. 20. 1s.

2. *Lancet*, March 27, p. 496.

**British Association**

The annual meeting of the association will be held in Brighton from Sept. 8 to 15, under the presidency of Sir Henry Tizard, F.R.S.

**Society of Apothecaries of London**

Prof. John McMichael will deliver the Joseph Strickland Goodall lecture at the hall of the society, Black Friars Lane, Queen Victoria Street, E.C.4, on Thursday, June 3, at 5 P.M. He is to speak on the Pharmacology of Heart-failure.

**Research Board for the Correlation of Medical Science and Physical Education**

The William Hyde award for 1947 has been made to Dr. L. G. C. Pugh in recognition of his work on rheumatism.

**Research Defence Society**

On Tuesday, June 8, at 3.15 P.M., at 26, Portland Place, London, W.1, Prof. P. A. Buxton, F.R.S., will deliver the seventeenth Stephen Paget lecture. He is to speak on Tsetse Flies and the Development of Africa.

**Population and World Resources in Relation to the Family**

An international conference on this subject is to be held at Cheltenham from Aug. 23 to 27, under the chairmanship of Lord Horder. Further information may be had from the Cheltenham Congress Organiser, 37, Park Street, London, W.1.

**Conference at Aix-les-Bains**

The Municipality and the Medical Society of Aix-les-Bains are holding a conference on chronic degenerative rheumatism from June 24 to 27 under the presidency of Prof. René Leriche. Further information may be had from Dr. Gerbay, Square Alfred Boucher, Aix-les-Bains.

**Professor of Surgery in Nigeria**

Dr. Beatrice Joly has been appointed professor of surgery at University College, Ibadan, Nigeria.

Dr. Joly graduated M.B. from the Royal Free Hospital with honours in medicine in 1930. Three years later she took her M.D. in obstetrics and gynaecology and obtained the M.R.C.P. In 1939 she became F.R.C.S.E. At present she holds the chair of surgery at the Lady Hardinge Medical College, New Delhi.

**Where Does Freedom End?**

The British Social Hygiene Council is holding a conference on this subject on Thursday, June 10, at 2 P.M., at Livingstone Hall, Broadway, London, S.W.1, to discuss the tension between society and the individual. Tickets may be had from the secretary of the council (Dept. M.2), Tavistock House North, W.C.1.

**Civil Nursing Reserve Disbands**

The Minister of Health has decided that on July 5 the Civil Nursing Reserve will cease to exist as a separate organisation. Members will be transferred to the ordinary nursing staff of the service in which they are employed and the conditions of service of the ordinary nursing staff will apply to them. In thanking past and present members of the reserve for the work they have done, Mr. Bevan expressed the hope that they would continue to give all the service they could to help in relieving the shortage of nurses. There was, he pointed out, ample scope for part-time service for those who cannot take a full-time job.

**Indian Appointment**

Dr. Chuni Lal Katial has been appointed director-general of the Employees State Health Insurance Corporation of the Dominion of India.

Dr. Chuni Lal Katial has been in general practice in Finsbury for the past 22 years, during which he has taken an active part in the medical services and the public-health organisation of the borough. He became a councillor in 1934, served as mayor in 1938, and he was raised to the aldermanic bench in 1945. At the last elections he joined the London County Council as one of the representatives of the borough.

For a number of years he was also chairman of Finsbury public-health committee, and it was largely through his influence that the health centre in Pine Street was built. On June 8 the honorary freedom of the borough is to be conferred on Dr. Katial.

Dr. Jens Foged, chief surgeon at the Bispebjerg Hospital, Copenhagen, is spending a month in Britain at the invitation of the British Council.

**CORRIGENDUM: Exophthalmic Ophthalmoplegia.**—In the paper by Mr. Critchley and Mr. Cameron on p. 751 of our last issue the daily dose of 'Prostigmin' given by injection should have been stated as 0.125 milligrammes rising to 0.5 milligrammes (not grammes).

**Diary of the Week**

MAY 23 TO 29

**Monday, 24th**

ROYAL COLLEGE OF PHYSICIANS, Pall Mall East, S.W.1  
5 P.M. Dr. Denis Williams: Disorders of Consciousness.

**Tuesday, 25th**

ROYAL COLLEGE OF PHYSICIANS  
5 P.M. Dr. J. G. Hawksley: Gastritis.  
INSTITUTE OF DERMATOLOGY, 5, Lisle Street, W.C.2  
5 P.M. Dr. R. T. Brain: Bullous Eruptions.

**EUGENICS SOCIETY**

5.30 P.M. (Burlington House, Piccadilly, W.1.) Prof. Brinley Thomas, Ph.D.: Migration and the British Commonwealth.  
EDINBURGH POST-GRADUATE BOARD FOR MEDICINE  
5 P.M. (Royal Infirmary.) Prof. W. Melville Arnott: Clinical Physiology of the Pulmonary Circulation.

**Wednesday, 26th**

UNIVERSITY OF LONDON  
5 P.M. (St. Mary's Hospital medical school.) Prof. J. Brachet (Brussels): Localisation and Role of Nucleic Acids in the Cell. (First lecture.)

**UNIVERSITY OF GLASGOW**

8 P.M. (Department of Ophthalmology.) Mr. O. M. Duthie: Cataract Extraction.

**Thursday, 27th**

ROYAL COLLEGE OF PHYSICIANS  
5 P.M. Prof. R. V. Christie: Renal Function in Disease.  
BRITISH INSTITUTE OF RADIOLOGY, 32, Welbeck Street, W.1  
6 P.M. Dr. Gösta Runström (Göteborg): Röntgen-Anatomical Appearance of Infantile Pyloric Stenosis.

**MEDICO-LEGAL SOCIETY**

8.15 P.M. (26, Portland Place, W.1.) Chief Detective-Inspector C. R. M. Cuthbert: Investigation of Crime.

**HONYMAN GILLESPIE LECTURE**

4.30 P.M. (Edinburgh Royal Infirmary.) Mr. H. W. Porter: Partial Gastrectomy for Peptic Ulcer.

**Friday, 28th**

ROYAL COLLEGE OF PHYSICIANS  
5 P.M. Sir Leonard Parsons, F.R.S.: Hæmolytic Disease of the Newborn.

**UNIVERSITY OF LONDON**

5 P.M. (St. Mary's Hospital medical school.) Professor Brachet: Localisation and Role of Nucleic Acids in the Embryo. (Second lecture.)

**Saturday, 29th****BIOCHEMICAL SOCIETY**

1 P.M. (Department of Biochemistry, University Museum, Oxford.) Short papers and demonstrations.

**Births, Marriages, and Deaths****BIRTHS**

ANDERSON.—On May 9, at Woking, the wife of Dr. A. W. Anderson—a daughter.  
BROWNE.—On May 9, the wife of Dr. H. J. Browne—a daughter.  
CLELAND.—On May 12, at Epsom, the wife of Mr. William Cleland, F.R.C.S.—a son.  
CRAWSHAW.—On May 13, at Johannesburg, to Dr. Barbara Statham, the wife of Mr. G. R. Crawshaw, F.R.C.S.—a daughter.  
FAIRBANK.—On May 14, in London, the wife of Mr. T. J. Fairbank, F.R.C.S.—a son.  
HOWAT.—On May 11, to Dr. Margaret Harker, the wife of Dr. James Howat—a son.  
LENNOX.—On May 11, in London, the wife of Dr. Bernard Lennox—a son.  
\*MURLEY.—On May 6, the wife of Mr. R. S. Murley, F.R.C.S.—a daughter.  
NAUNTON.—On May 10, the wife of Dr. W. J. Naunton—a daughter.  
RISHWORTH.—On May 13, the wife of Dr. J. M. Rishworth—a son.  
ST. JOHN-BROOKS.—On April 3, at Timaru, New Zealand, the wife of Dr. W. H. St. John-Brooks—a daughter.  
WHEELDON.—On May 11, in London, the wife of Mr. F. T. Wheelton, F.R.C.S.—a son.

**MARRIAGE**

RUSHTON-WHEYWAY.—On May 8, at Great Barr, John C. Rushton, M.B.C.S., to Joan Mary Wheyway.

**DEATHS**

AITCHISON.—On May 9, at Cotswood Sanatorium, Charles U. Aitchison, M.A. Oxid, M.R.C.S., aged 38.  
ARTHUR.—On May 12, at Brockham, Betchworth, Surrey, Joseph Hugh Arthur, M.D. Lond., aged 73.  
CADDY.—On April 15, in Melbourne, Arnold Caddy, F.R.C.S., aged 81.  
CONFORD.—On May 15, at Felixstowe, George James Conford, M.A., D.M. Oxid, aged 78.  
KILKELLY.—On May 9, at Greystones, Eire, Patrick Percy Kilkelly, M.B. Dubl., Lieut.-colonel, I.M.S.  
MULDavin.—On April 24, in New York City, Leon F. Muldavin, M.D. New York, M.R.C.S., aged 37.  
RICHARDSON.—On May 11, Joseph Richard Whitehead Richardson, M.R.C.S., aged 48.  
VINES.—On May 8, at Newport, Mon., Charles Stuart Vines, M.R.C.S., D.P.H., aged 82.  
WATTS.—On May 14, in London, Brian Watts, D.S.O., M.D. Brux., D.P.H., colonel, R.A.M.C.

\* Amended notice.



# THE LANCET

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## POST-HEPATITIS CIRRHOSIS

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ACUTE hepatitis is normally followed by complete recovery, but long-term sequelæ are not unknown.

Jones and Minot (1923) described 2 cases of young patients in whom clinically diagnosed cirrhosis developed after "catarrhal jaundice." Bergstrand (1930) called attention to the sequence, and Polack (1938) noted 8 patients in whom cirrhosis occurred after acute epidemic hepatitis. The bilirubin-excretion test has been found abnormal many years after acute hepatitis (Soffer and Paulson 1934, Kornberg 1942). Altschule and Gilligan (1944) investigated 36 unselected subjects one to twenty-nine years after acute hepatitis and found slight hepatomegaly and increased serum-bilirubin in 9 of them. Cirrhosis following an attack of acute hepatitis has occasionally been demonstrated at operation for at necropsy (Findlay et al. 1944, Rennie 1945) or by aspiration biopsy (Krarup and Roholm 1941, Axenfeld and Brass 1942), but in most instances the hepatic histology has not been ascertained.

During the last five years I have studied 9 patients in whom hepatic cirrhosis could reasonably be related to a preceding acute hepatitis. Aspiration biopsy has been used for comparing changes in the liver with changes in the clinical picture, blood biochemistry, and liver-function tests. Cases 2 and 3 have previously been reported at the time of the initial diagnosis (Dible et al. 1943). The course of the whole group is now discussed in relation to pathogenesis, diagnosis, and outcome.

Of the 9 patients, 6 were soldiers studied through the coöperation of the Army authorities and 3 were civilians from the hospital practice. In 6 the hepatitis was of the simple "infective" type; in 3 it was of the "serum" variety following arsenotherapy for syphilis. In 7 patients liver tissue was obtained by aspiration biopsy (Sherlock 1945), more than one biopsy being performed in 4 cases. In the other 2 patients liver tissue was obtained at operation.

The biochemical methods used were the estimation of serum-bilirubin, cholesterol, alkaline phosphatase, and the intravenous hippuric-acid test (Sherlock 1946a and b). The colloidal gold reaction (Maclagan 1944) and the bromsulphthalein test were also used; in the latter a dose of 5 mg. per kg. of body-weight was given and samples were taken after 5 min. and 30 min. (Helm and Machella 1942).

## CASE-RECORDS

An arbitrary division into three groups has been based on whether the patients ultimately developed: (1) definite but well-compensated cirrhosis with no clinical or biochemical abnormalities; (2) hepatic failure without conspicuous portal hypertension; or (3) portal hypertension with little evidence of hepatic cell failure. The overlap, particularly between groups II and III, is discussed below. Biochemical results are summarised in the accompanying table.

*Group I—Well-compensated Cirrhosis*

The first patient was studied from the original acute hepatitis through to the resultant hepatic cirrhosis.

Case 1.—A male civilian, aged 33, had his last arsenic injection for syphilis on Jan. 28, 1945. Three months later he was admitted to hospital with nausea, vomiting, and jaundice. The liver was palpable 6 cm. below the costal margin, and the spleen could just be felt. The urine contained both urobilinogen and bile pigments. The serum-bilirubin level was 6.2 mg. per 100 ml.

The first aspiration liver biopsy (May 8, 1945) reveals a severe hepatitis (fig. 1). The lobular centre shows severe hepatic cell autolysis, with surviving cells isolated in wide areas of necrosis. The portal tracts are heavily infiltrated with round cells. The reticulin framework is well preserved.

With the moderate icterus, urobilinogenuria, and the observed hepatic histology a rapid recovery was expected. However, the jaundice increased, and on May 21, 1945, the serum-bilirubin level was 17.5 mg. per 100 ml. Urobilinogen had disappeared from the urine.

The second aspiration liver biopsy (May 21, 1945) shows a general picture of severe hepatitis similar to that seen at the first biopsy. This appearance is not constant throughout the section (fig. 2). Here and there nodules of liver tissue seem to have been isolated by areas of necrosis and fibrosis. There is considerable reticular condensation and new reticulin formation is seen at the lobular centres and in the portal tracts. The central areas tend to be linked with the portal tracts by bands of fibrous tissue.

Clinical recovery then proceeded uneventfully, and on June 12, 1945, the liver and spleen were no longer palpable. The only biochemical abnormality was a serum-bilirubin level of 2.6 mg. per 100 ml. (see table). The second biopsy suggested the possible development of a hepatic cirrhosis, and a third biopsy, on June 14, 1945, shows a definite cirrhosis (fig. 3). Bands of connective tissue containing numerous round cells and proliferating bile-ducts disturb the normal lobular architecture. Nodules of liver cells showing regeneration have been isolated. Many apparently normal liver cells survive; reticulin stains confirm the presence of cirrhosis.

The patient has since remained well, and on June 27, 1947, when he attended the follow-up clinic, he was symptom-free. His appetite and digestion generally were excellent, his weight was normal, he had had no further jaundice, his liver and spleen were not palpable, his urine did not contain urobilinogen, and blood biochemical tests gave normal results.

*Summary.*—Successive aspiration biopsies in a man of 33 with severe arsenotherapy jaundice showed the development of a hepatic cirrhosis. In spite of this, clinical recovery was complete, and two years later there were no clinical stigmata of liver disease and biochemical tests gave normal results.

Case 2.—In May, 1942, a soldier, aged 29, had an acute and clinically severe attack of arsenotherapy "serum" jaundice. Jaundice was deep. In June he developed gross oedema of the legs, clubbing of the fingers, and ascites severe enough to require four paracenteses. By the end of August clinical recovery was apparently complete.

In September, 1942, the patient was referred to Hammer-smith Hospital for investigation. He was symptom-free, but the fingers were still clubbed and purple striae were present

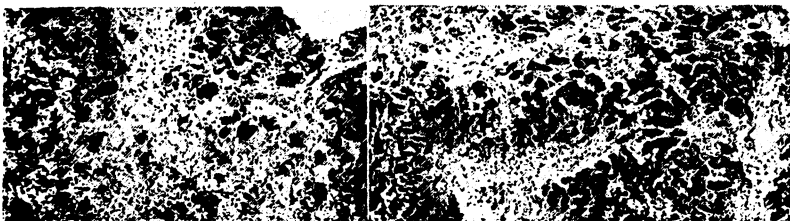


Fig. 1.—Case 1, 10th day: severe acute hepatitis, with groups of liver cells surviving in wide areas of necrosis. Best's carmine stain. ( $\times 48$ .)

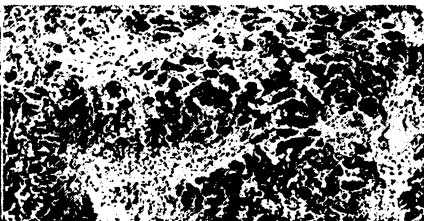


Fig. 2.—Case 1, 23rd day: severe hepatitis still present; lobular centres becoming linked with portal tracts. Best's carmine stain. ( $\times 48$ .)

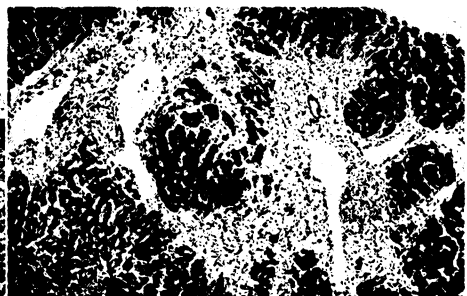


Fig. 3.—Case 1, 47th day: fully developed hepatic cirrhosis. Best's carmine stain. ( $\times 48$ .)

over the lower abdomen and thighs. There was no oedema or ascites. The liver edge was firm and could be felt 2 cm. below the costal margin. The spleen was just palpable. Urobilinogenuria was absent. The serum-bilirubin level was 0.5 mg. per 100 ml.

Aspiration liver biopsy on Sept. 18, 1942, shows a definite cirrhosis (fig. 4). The hepatic lobular pattern is distorted by bands of fibrous tissue containing new bile-ducts, among which were isolated nodules of apparently healthy liver cells.

In June, 1944, the patient volunteered for further study. He had remained in the Army and was able to follow his occupation of telephonist. There were no digestive symptoms. His weight was maintained and he had had no further jaundice. Finger clubbing was still present. The liver and spleen were not palpable. There was no urobilinogenuria, and blood biochemistry gave normal results (see table). A second aspiration liver biopsy (June 22, 1944) still shows definite cirrhosis, but all evidence of acute inflammation has disappeared (fig. 5).

In May, 1946, the patient again volunteered for investigation. In the intervening two years he had remained well. Physical signs and biochemical findings were similar to those of June, 1944. At the third aspiration liver biopsy (May 22, 1946) it is seen that the hepatic cirrhosis persists, though the fibrous bands are a little narrower and less cellular; the hepatic cells appear normal (fig. 6).

In July, 1947, the patient, who had been demobilised, replied to a letter: "I feel almost pre-war. I work hard all day driving a van and delivering parcels and usually spend a couple of hours gardening each evening."

**Summary.**—A soldier of 29 suffered from an unduly severe arsenotherapy hepatitis. Clinical recovery was eventually complete, but three liver biopsies performed in the next five years showed definite hepatic cirrhosis. The lesion appears to be inactive. The patient is symptom-free, and blood biochemistry is normal.

**Case 3.**—A woman, aged 71, had had prodromal gastro-intestinal symptoms followed in May, 1942, by painless jaundice which, though fluctuant, persisted until her admission to Hammersmith Hospital on Oct. 2, 1942. The patient was well nourished. The liver edge was firm and reached the level of the umbilicus. The spleen was not palpable. There was no oedema or ascites. The serum-bilirubin level was 4.4 mg. per 100 ml. Aspiration liver biopsy on Oct. 4, 1942, shows a chronic lesion with fibrosis, new bile-duct formations, and the isolation of islets of liver cells by fibrous tissue. During the next seven weeks the jaundice cleared and the patient was discharged symptom-free.

In November, 1943, the patient reported for a routine follow-up examination and volunteered for further study. She was symptom-free and had gained a stone in weight. The liver edge was now only 2 cm. below the costal margin. There was urobilinogenuria, and the serum-bilirubin level was 0.5 mg. per 100 ml. Biochemical tests gave normal results. At a second aspiration biopsy on Nov. 22, 1943,

the trocar pierced the firm liver substance with difficulty, and the specimen obtained was rather small. Fibrosis, bile-duct proliferation, and nodular hyperplasia are seen. The remaining liver cells appear healthier than in the previous section.

In May, 1945, the patient was admitted to hospital with mild gastro-enteritis of two days' duration. The liver was felt 4 cm. below the costal margin. There was urobilin in the urine. The serum-bilirubin level was 0.8 mg. per 100 ml.; and, apart from a serum-phosphatase concentration of 24 units per 100 ml., biochemical findings were normal. In a week she made a good recovery. In February, 1946, and August, 1947, the patient reported to the follow-up clinic. She was in very good health and, though now aged 76, did all her own housework. There was no splenomegaly or urobilinuria, and biochemical tests again gave normal results.

**Summary.**—A woman of 71 was shown to have hepatic cirrhosis five months after the onset of acute infective hepatitis. During the next five years, apart from an attack of gastro-enteritis, she had remained well. There are no clinical features suggesting liver disease. Biochemical tests give normal results. Histologically, the hepatic lesion appears inactive.

**Group II—Cirrhosis with Hepatocellular Failure**

**Case 4.**—In June, 1945, a housewife, aged 67, complained of anorexia, epigastric discomfort, and flatulence. Seven days later she developed jaundice, which remained undiminished for eight weeks.

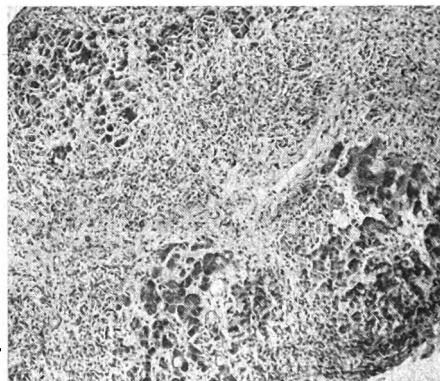


Fig. 7.—Case 5, May, 1945: a very active cirrhosis; remaining liver cells are degenerate and show fatty change. Best's carmine stain. (x58.)

Though the icterus then lessened it did not entirely disappear, and some abdominal discomfort persisted. At the end of January, 1946, jaundice increased, and a fortnight later the patient was admitted to a surgical ward. Jaundice was now deep. A vascular telangiectasis ("spider") was seen over one

eye. The liver edge was firm and was palpated 6 cm. below the costal margin. The spleen was not palpable. Ascites was detected, and there was pitting oedema over the sacral region and ankles. The urine contained both urobilinogen and bile-pigments. The serum-bilirubin level was 12.2 mg. per 100 ml., and other biochemical tests indicated severe liver damage (see table). Cholelithiasis was suspected.

At operation, on Feb. 14, 1946, a firm and very cirrhotic liver was found. The bile passages were clear. Hepatic sections showed the isolation of clumps of largely

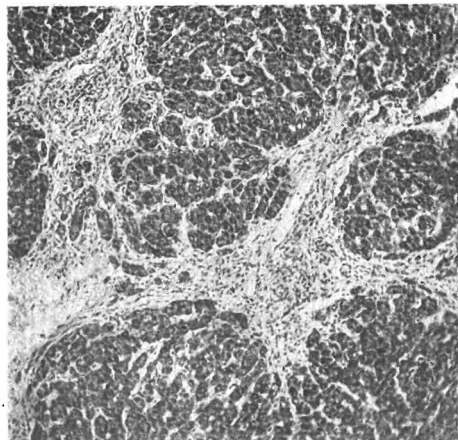


Fig. 4.—Case 2, September, 1942: cirrhosis with fibrosis and isolation of nodule of liver cells, some of which show fatty change. Best's carmine stain. (x58.)

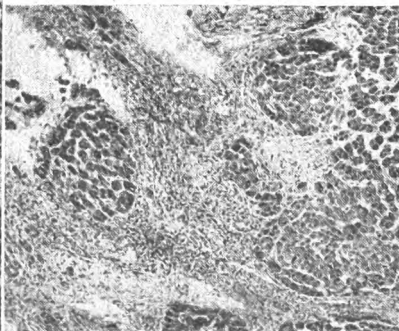


Fig. 5.—Case 2, June, 1944: cirrhosis persists; fatty change not now present. Best's carmine stain. (x58.)

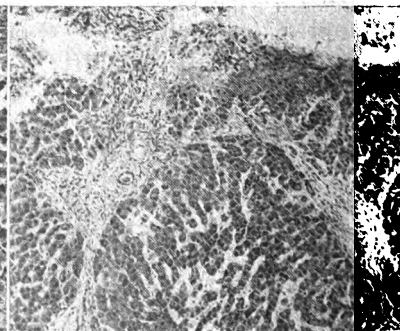


Fig. 6.—Case 2, May, 1946: lesion appears inactive; connective tissue bands are narrower than those seen in 1944. Best's carmine stain. (x58.)

## BIOCHEMICAL FINDINGS IN POST-HEPATITIS CIRRHOSIS

Case no.	Date	Serum-bilirubin (mg./100 ml.)	Serum-phosphatase (mg./100 ml.)	Serum-cholesterol (mg./100 ml.)	Serum-proteins (g./100 ml.)		Colloidal gold test	Bromsulphthalein retention* (% of standard)	Hippuric acid (g.) †	Urobilinogen in urine
					Albumin	Globulin				
	Normal range ..	0.5-1.0	4-13	120-230	3.4-5.0	1.5-3.0	0-2	0-10	0.75-1.2	-
1	May 7, 1945	6.2	12.0	161	4.2	1.9	0	..	0.2	+
	" 21 "	17.5	22.0	169	3.9	2.8	4	..	0.2	-
	June 12 "	2.6	14.0	177	3.8	2.7	..	9	0.9	+
	" 27, 1947	0.5	10.0	247	4.0	1.9	0	0	..	-
2	Sept. 18, 1942	0.5	10.0	190	4.0	2.2	..	..	..	-
	June 22, 1944	0.5	4.0	178	4.8	1.0	0	0	1.05	-
	May 26, 1946	0.5	9.0	236	4.6	3.0	..	0	0.88	-
3	Oct. 3, 1942	4.4	37.0	315	..	..	..	..	..	+
	Nov. 22, 1943	0.5	20.0	..	..	..	..	0	..	-
	May 17, 1945	0.8	24.0	175	4.3	2.6	0	..	..	+
	Feb. 5, 1946	0.5	9.9	229	5.1	3.4	0	..	..	-
	Aug. 15, 1947	0.5	8.7	280	4.2	3.6	0	..	..	-
4	Feb. 11, 1946	12.2	20.6	156	2.8	4.1	5	..	..	+
5	May 14, 1945	2.2	11.1	146	3.7	4.4	5	13	0.3	+
6	Jan. 7, 1945	1.8	13.6	143	3.9	2.7	5	..	0.4	+
	Nov. 7, 1946	0.5	..	..	..	..	..	..	..	..
7	April 23, 1945	0.7	12.0	185	4.8	2.7	0	5	0.95	+
	Oct. 19, 1945	0.6	10.3	173	4.6	3.2	0	..	..	+
	Feb. 5, 1946	1.5	8.7	176	4.6	3.6	0	..	..	+
	March 24, 1947	0.5	10.5	281	4.7	2.8	0	5.3	..	+
8	July 24, 1947	0.5	13.0	140	3.4	2.2	4	9.6	0.67	+
9	Nov. 12, 1943	1.1	4.5	..	..	..	..	5.6	1.04	+
	May 20, 1947	0.5	..	..	..	..	..	..	..	-

\* % of standard retained at 30 min.

† Excretion in 1 hr. after intravenous dose.

degenerate liver cells by bands of connective tissue containing inflammatory cells and proliferating bile-ducts. The patient did not recover from the operation. At necropsy the liver weighed 960 g. and the spleen 500 g. There were no oesophageal varices or rectal hæmorrhoids.

**Summary.**—A woman of 67 had acute hepatitis followed eight months later by an exacerbation of jaundice. She died from hepatic failure after an operation for suspected gall-stones. Necropsy showed a very active cirrhosis.

**Case 5.**—In June, 1944, while in Italy, a Canadian soldier, aged 41, suffered from anorexia, vomiting, diarrhoea, and mild jaundice. Infective hepatitis was epidemic there at the time. He made a good recovery, but in September, 1944, he had further vomiting and diarrhoea, and the liver edge was felt 6 cm. below the right costal margin. During the next six months he was admitted to hospital several times. He lost 30 lb. in weight. In March, 1945, his general health improved, and he gained weight and became symptom-free, but hepatomegaly persisted, and in May, 1945, he was admitted to Hammersmith Hospital.

The patient was obese and faintly icteric. An urticarial eruption appeared on the trunk and arms every morning. The liver edge was tender and was felt 6 cm. below the right costal margin. The spleen could just be palpated. There was no ascites or peripheral oedema. Urobilinogenuria was constant. The serum-bilirubin level was 2.2 mg. per 100 ml. Plasma-protein tests indicated gross impairment of liver function (see table).

Aspiration liver biopsy shows a very active cirrhosis. Apart from the fibrosis and disturbance of lobular architecture, many of the hepatic cells are necrotic, and some show fatty change (fig. 7).

In August, 1947, the patient replied to a letter. He had been demobilised and returned to Canada. He used to be a steel worker but was now fit only for light duties as a club

steward. He had occasional jaundice lasting for about a week and also complained of bleeding piles.

**Summary.**—A soldier of 41 suffered from epidemic infective hepatitis, and eleven months later a very active cirrhosis was found. Three years after the initial hepatitis he had episodes of jaundice and rectal bleeding.

**Group III—Cirrhosis with Portal Circulatory Obstruction**

**Case 6.**—In May, 1944, while in India, a regular soldier, aged 29, had a typical acute infective hepatitis. He was in hospital for twenty-six days and apparently made a good recovery. Five weeks later he was again taken ill, with nausea, anorexia, and pruritus. Deep jaundice developed. The liver and spleen were enlarged. After a month the jaundice was less, though liver and spleen were still palpable. In January, 1945, he was admitted to Hammersmith Hospital. He was then symptom-free.

The patient was a well-developed man with faint conjunctival icterus. The liver edge was felt 7 cm. below the costal margin, and the spleen was enlarged to the umbilicus. Neither ascites nor peripheral oedema was detected. The urine contained a constant excess of urobilinogen. The serum-bilirubin level was 1.8 mg per 100 ml., and biochemical tests showed impairment of hepatic function (see table).

Aspiration liver biopsy (Jan. 15, 1945) shows a hepatitis with much round-cell infiltration in the portal tracts. There is histiocytic increase in the sinusoids. Centrilobular liver cells show some necrotic changes (fig. 8). The reticular fibres in the portal zones are increased, and the central vein and portal tracts tend to become linked by connective tissue.

The patient was discharged from the Army and remained well and at work until Nov. 17, 1946, when he vomited; the vomitus containing a few spots of bright red blood. He was admitted to another hospital. There was no jaundice; the liver was just palpable. The spleen was grossly enlarged and tender. While in the ward he had repeated massive

hæmatemeses and, despite transfusion, died within twenty-four hours.

At necropsy (Nov. 19, 1946, Dr. C. C. Bryson) the liver weighed 1480 g. and showed a finely granular cirrhosis. The diagnosis of splenomegaly was confirmed, the spleen weighing 1680 g. There was no ascites. Bleeding had occurred from ruptured varicose veins at the lower end of the œsophagus. The intestines were full of dark blood. Hepatic sections show a typical cirrhotic lesion (fig. 9). Surviving liver cells are reasonably normal. The acute reaction shown in 1945 is no longer evident.

*Summary.*—A soldier of 29 suffered from relapsing acute infective hepatitis which developed into hepatic cirrhosis. He died from ruptured varicosities two and a half years after the first attack. Necropsy confirmed the presence of cirrhosis.

**Case 7.**—In February, 1944, a soldier, aged 35, had arsenotherapy "serum" jaundice. Icterus persisted for three or four months. In July he again became jaundiced and was admitted to a military hospital. The serum-bilirubin level was 20 mg. per 100 ml. He slowly recovered but in January, 1945, was invalided from the Army.

In March, 1945, he was admitted to Hammersmith Hospital. There was general malaise. Exertion caused dyspnoea and pain in the left side. Appetite and digestion generally were excellent. Occasionally the urine was darker than usual and the patient passed a pale stool. He was a thin fallow man with "spider" nævi of the type described in chronic liver disease on his face, necklance area, and wrists. The liver edge was tender and just palpable below the costal margin. The spleen was enlarged half-way to the umbilicus. The urine contained a constant excess of urobilinogen. The serum-bilirubin level was 0.7 mg. per 100 ml., and other biochemical tests were normal (see table). A barium swallow on this and subsequent occasions did not reveal any œsophageal varices.

Aspiration liver biopsy (April 4, 1945) shows a hepatic cirrhosis. Between bands of relative acellular fibrous tissue containing numerous bile-ducts nodules of liver tissue are isolated. Towards the periphery of the nodules the hepatic cells show fatty change.

The patient was seen in February, 1946, and reported to be well, apart from occasional pain over the spleen on exertion, but in April, 1946, he had a hæmatemesis of about 4 pints. There was no nausea or pain. For three months he was an inpatient in another hospital. His hæmoglobin was 40% (Haldane). No cause for the gastro-intestinal bleeding was discovered. He was discharged well. In October, 1946, he had a sudden attack of perisplenitis, from which he rapidly recovered.

In December, 1946, the patient vomited about 2 pints of red blood. He was in hospital for three weeks. Again in March, 1947, he was admitted to Hammersmith Hospital with melena. There were no other complaints, and he could play 18 holes of golf without fatigue. The spleen and liver were no longer tender, but the physical signs were otherwise unchanged. There was no urobilinuria. The serum-bilirubin level was less than 0.5 mg. per 100 ml. Hepatic-function tests were normal (see table). Gastroscopy showed a deeply congested red gastric mucosa with much froth and mucus. No veins were seen. A fractional test-meal showed a very low free-acid curve. This examination was followed by two small hæmatemeses of about 5 oz. each. The patient was treated with a bland diet and aluminium hydroxide gel and discharged from hospital reasonably well.

In June, 1947, he had a further melena and his hæmoglobin was 67% (Haden). In October, 1947, there were further severe hæmatemeses and his hæmoglobin fell to 19%. Œsophageal varicosities were seen by œsophagoscopy. Multiple blood-transfusions were given, and a portocaval venous anastomosis was attempted. Unfortunately the patient's general condition was so bad that he did not survive the operation.

At necropsy the liver weighed 1760 g. and showed a finely granular cirrhosis. The spleen weighed 514 g. Œsophageal varices were present. Sections of liver showed the same appearances as in 1945. Fatty change was still present in the liver cells.

*Summary.*—A soldier of 35 developed hepatic cirrhosis after severe arsenotherapy jaundice. During the next three years hepatomegaly and splenomegaly persisted, and he had multiple gastro-intestinal hæmorrhages. He died three and a half years after the original acute hepatitis.

**Case 8.**—In 1941, while in the Western Desert, a regular soldier, aged 27, had infective hepatitis. He was jaundiced for only three weeks and made a good clinical recovery. In 1942 he again suffered from anorexia, nausea, and upper abdominal discomfort followed by jaundice, from which he again recovered. In Sicily he had malaria, and in the Normandy campaign he sustained a fractured pelvis. Again he recovered and resumed duties as an A 1 soldier.

In April, 1947, he had morning nausea and flatulence. There was a continual right upper abdominal ache, and his appetite was poor. He lost a stone in weight. In May, 1947, he vomited about three teaspoonfuls of bright red blood. He was admitted to a military hospital, where he had further episodes of vomiting, the vomitus often being streaked with fresh blood. These symptoms subsided in about a month.

In July, 1947, he was admitted to Hammersmith Hospital. The liver edge was just palpable. The spleen was firm and enlarged to the level of the umbilicus. The urine contained excess of urobilinogen. The serum-bilirubin level was 0.5 mg. per 100 ml. Liver-function tests showed only slight deviation from the normal (see table). Œsophageal varices were not seen radiographically, and gastroscopy showed a normal gastric mucosa. Proctoscopy revealed a congested rectal mucosa with one hæmorrhoid. There was no reticulocytosis.

Aspiration liver biopsy failed because of the firmness of the liver, but biopsy performed at laparotomy shows a definite hepatic cirrhosis (fig. 10). Surviving liver cells were reasonably normal.

*Summary.*—In 1941 a soldier of 27 suffered from mild infective hepatitis. In 1942 there was a further attack of hepatitis. In 1947 he was shown to have a hepatic cirrhosis. The spleen was very large. He has had repeated small hæmatemeses.

**Case 9.**—In March, 1943, a soldier, aged 22, had acute infective hepatitis. Moderate icterus lasted three weeks, and convalescence for a further seven weeks, but clinical recovery was never complete. Exertion was associated with right upper abdominal discomfort and a greenish "bilious" complexion. The patient was admitted to Hammersmith

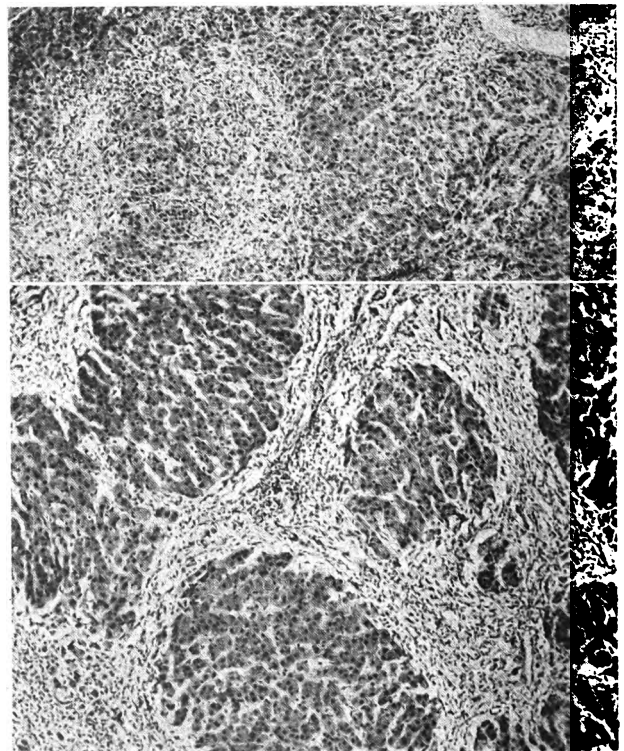


Fig. 8 (above)—Case 6, January, 1945: acute hepatitis with much cellular infiltration of sinusoids and portal tracts; lobular pattern abnormal. Best's carmine stain. ( $\times 58$ .)

Fig. 9 (below)—Case 6, November, 1946: a fully developed cirrhosis; acute inflammatory reaction no longer seen. Haematoxylin and eosin. ( $\times 58$ .)

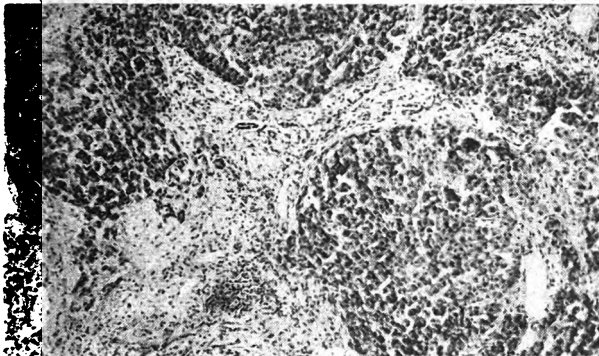


Fig. 10—Case 8, July, 1947: a cirrhosis with wide fibrous tissue bands and nodular hyperplasia of liver cells. Best's carmine stain. ( $\times 58$ .)

Hospital on Nov. 12, 1943. There was no icterus. The liver edge was felt 4 cm. below the costal margin and was firm and slightly tender. The spleen was not palpable. The urine contained a constant excess of urobilinogen. Bromsulphthalein excretion was the only liver-function test giving abnormal results (see table).

Aspiration liver biopsy (Nov. 14, 1943) shows a definite hepatic cirrhosis with conspicuous fibrosis and bile-duct proliferation. The surviving hepatic cells are fairly normal.

The patient remained fairly well until January, 1947, when he vomited blood. He was in bed eight weeks with great fatigue and dizziness. In May, 1947, he was admitted to a Belfast hospital for melæna. He was not jaundiced and there was no ascites or peripheral œdema. On the abdominal wall the portal collateral veins were engorged. The liver edge was now felt at the level of the umbilicus, and the right diaphragm was elevated. The spleen could also be palpated. The patient improved a little with rest in bed and was then discharged home.

**Summary.**—A soldier of 22 had a moderately severe acute infective hepatitis, and eight months later he was shown to have hepatic cirrhosis. Five years after the original illness he had evidence of portal vascular obstruction.

#### DISCUSSION

##### *Pathogenesis of the Cirrhosis*

The term "hepatic cirrhosis" is confined to those cases in which the liver shows not only fibrosis but also a disturbance of the normal lobular pattern with isolated nodules of hyperplastic liver cells.

After acute hepatitis the histology of the liver usually returns completely to normal. There may be residual scarring in the anatomical portal tracts (Dible et al. 1943), but this produces no demonstrable disturbance of function, and these scars may disappear with the passage of years. Usually in acute hepatitis the reticulin framework of the liver lobule remains intact, and regeneration of liver cells follows a normal anatomical pattern. In very severe hepatitis the reticulin framework is distorted and condensed where liver cells have been lost, and cirrhosis is then apt to follow.

The scarring of cirrhosis may produce neither demonstrable disturbance of hepatic cellular function nor portal vascular obstruction (group 1). Moreover, the scarring may regress (case 2). These patients have been followed for only two to five years after the acute episode. Contraction of scar tissue may yet lead to portal hypertension. This has been the sequence of events in group III.

The inactive group may be confused with the "healed yellow atrophy" of earlier workers (Wilson and Goodpasture 1927, Mallory 1911), except that the large regenerated hepatic nodules described in that condition have not been seen. The livers of fatal cases in the present series presented a finely granular appearance to the naked eye.

In some cases the cirrhosis may be recognised at an early stage when hepatic cell necrosis is still prominent (group II), and clinically the jaundice and other symptoms may have persisted from the time of the acute attack. I have never observed an increase in the connective tissue in the absence of continuing parenchymal damage. Occasionally the patient dies during the stage of cellular insufficiency, but usually the cell necrosis subsides and the hepatic fibrosis may produce portal hypertension as a late result.

It is widely agreed that "infective" and "serum" hepatitis are virus diseases. Continuing parenchymal damage is difficult to explain on this basis alone, and other factors may be involved.

The hepatic histology in this series does not resemble the "cholangiolitic cirrhotic" picture described by Watson and Hoffbauer (1946).

##### *Relation to "Classical" Laennec's Portal Cirrhosis*

Ratnoff and Patek (1942) elicited a past history of jaundice in only 6.5% of 356 patients with cirrhosis. Howard and Watson (1947), however, obtained a history of previous infective hepatitis in 17% of patients with cirrhosis, contrasted with 3% in a similar group without hepatic disease. The absence of a history of previous jaundice does not exclude acute hepatitis in the past, for mild attacks may well be passed over as intercurrent infections, quickly forgotten, and not related to the succeeding hepatic cirrhosis. Bloomfield (1938) makes an interesting analogy between the natural histories of chronic hepatitis and chronic glomerulonephritis. Kelsall et al. (1947) can find no difference between the clinical and pathological features of cirrhosis developing with no known cause and those of cirrhosis preceded by hepatitis. Although there may be some differences in the finer histological detail of the livers in the present series and those of "classical" Laennec's cirrhosis, there seems no doubt that the two conditions may end with the same clinical picture. The exact importance of hepatitis in the ætiology of cirrhosis will be better assessed in the future when the effects of the great war-time epidemics can be more fully analysed.

##### *Incidence of Post-hepatitis Cirrhosis*

In liver biopsies on 120 patients with hepatitis, 9 cases of post-hepatitis cirrhosis were encountered. This does not reflect the true incidence of this complication, since the present group is partly selected. Patients with persistent symptoms or physical signs after hepatitis have often been referred to the Postgraduate School for special investigation.

##### *Diagnosis*

Cirrhosis most often follows acute hepatitis which is severe, protracted, or relapsing. Clinical severity, however, does not always parallel the extent of hepatic necrosis; and, though in 3 patients the initial jaundice was deep, in 3 it was remarkably mild. In 6 patients the hepatitis was protracted or relapsing. Subacute hepatic necrosis is present in these cases and, as described above, this proceeds to cirrhosis.

Patients convalescent from hepatitis often have persistent symptoms, particularly fatigue, dyspepsia, variable appetite, and discomfort over the liver on exertion. The liver is often palpable, and the spleen may just be felt. These patients require the fullest investigation. The development of cirrhosis after hepatitis is rare. In most of these patients the symptoms have no established anatomical basis and are possibly of psychogenic origin. The condition has been designated the post-hepatitis syndrome and has been discussed elsewhere (Sherlock and Walshe 1946). The syndrome is rarely encountered except during the first year after the acute hepatitis.

The presence of the vascular telangiectasis characteristic of liver disease, a very large spleen, and a constant

excess of urobilinogen in the urine suggests organic hepatic damage. Routine biochemical tests are often of no diagnostic value. In 4 patients (cases 1, 2, 3, and 7) all the values obtained were within the normal range (see table). A conspicuous rise in the serum-bilirubin concentration is unusual. The bromsulphthalein-excretion test seems the most useful biochemical aid. In only 2 of the 9 subjects were the laboratory findings those commonly described in decompensated cirrhosis. The diagnostic value of aspiration liver biopsy must therefore be emphasised. If the liver is very tough and fibrous, the method may not be successful. If necessary, laparotomy may then be performed.

#### Prognosis

Assessment in the individual patient may be very difficult. The outlook even in the apparently inactive case is uncertain. Episodes of decompensation are known to occur many years after the initial jaundice (Fiessinger et al. 1932). In our experience the main danger lies in the sequela of portal hypertension, especially gastro-intestinal hæmorrhage. Only 1 of our patients died of hepatocellular failure.

#### SUMMARY

Nine patients have been followed for periods up to five years from the development of post-hepatitis cirrhosis. The findings in serial aspiration liver biopsies and liver-function tests have been correlated with the clinical course of the disease.

In 3 patients the hepatic lesion was well compensated and produced no symptoms, physical signs, or biochemical changes. Hepatic cell necrosis was not histologically demonstrated.

In 2 patients hepatic cell necrosis and degeneration were prominent; there was slight jaundice; and abnormalities were found in most of the liver-function tests. One patient died of hepatic failure.

In 4 patients hepatic fibrosis was prominent and the symptoms and signs were those of portal circulatory obstruction; biochemical changes were slight or absent. Two patients died of gastro-intestinal bleeding.

The pathogenesis of the cirrhosis is discussed.

In diagnosis, routine biochemical tests often give no help, but the value of liver biopsy is emphasised.

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## BRONCHIECTASIS SIMULATING CHRONIC BRONCHITIS

A STUDY OF 46 CASES

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BRONCHIECTASIS is generally supposed to present characteristic symptoms, signs, and radiographic changes. The patient looks ill, his fingers are clubbed, he has a paroxysmal cough, producing much foul sputum; and he eventually dies of toxæmia or cerebral abscess. The only other form which is well recognised is the dry hæmorrhagic bronchiectasis, with repeated hæmoptyses but few symptoms or signs (Pinchin and Morlock 1930, Moll 1932, Wall and Hoyle 1933).

There is, however, a large group of patients with bronchiectasis in whom the symptoms and physical signs closely resemble chronic bronchitis. This condition was called simple bronchiectasis by Roles and Todd (1933) and was described by Kerley (1934). Such cases are rarely seen in civilian hospitals, because under ordinary conditions they have no difficulty in carrying on their work, the annual bout of winter bronchitis being regarded as inevitable and lightly dismissed. The opportunity for investigation therefore arises only when they are forced to seek help—e.g., when subjected to the physical strain of Army training.

During a period of eighteen months at a military hospital I examined 211 men and 3 women with symptoms and signs suggesting chronic bronchitis. Bronchography was performed in each case, and 46 patients (21%) were shown to have bronchiectasis.

The 214 patients were aged 18–49 and generally of moderate physique and well nourished and all but 3 were in categories A or B. When sent to the hospital as outpatients they were fully engaged in work or training, and before joining the Army most of them had been manual workers.

#### ETIOLOGY

In 26 of the 46 cases where bronchiectasis was discovered there was a past history of pneumonia. This had been contracted in either infancy or childhood in 13 cases, in 6 of which there had been two or more attacks, and in 1 four attacks. Pleurisy had occurred alone in 2 cases, in 1 of which it had appeared twice. Sanatorium treatment had been received by 3 patients, but in each case no tubercle bacilli were found in the sputum; nor was any other evidence of tuberculosis found. The sputum of about half of the 214 patients bronchographed was examined for tubercle bacilli with negative results. Only 4 patients gave a history of measles, and 1 of whooping-cough. A history of phosgene poisoning followed by bronchitic symptoms was given by 1 patient.

Most of the patients said that they had winter coughs and frequent colds.

#### SYMPTOMS

Productive cough and dyspnoea were the presenting symptoms in all 46 cases. Secondary symptoms were chest pain, sweats, loss of weight, and hæmoptysis. The cough was intermittent; it was aggravated by changes of temperature and by smoking, but except in the winter months it was not severe enough to cause disability. The sputum was either white mucoid material or thick and yellow. No complaint of malodour was made. The amount in 24 hours was 2–3 oz.

Dull aching pain in the base of the chest was felt in 16 cases. Night sweats were reported by 7 patients, in 3 of whom they were severe. Loss of weight was admitted by 2 men; one had lost a few pounds, the



other 1 stone. Loss of appetite was never complained of. Hæmoptysis had occurred in 12 cases; it consisted of sputum-staining in 9 cases, and small amounts of blood in the remaining 3. It was never sufficient to cause alarm.

#### PHYSICAL SIGNS

Diminished respiratory excursion was general, and was found at one or both bases. Impaired percussion note, poor air-entry, and persistent coarse râles were common. Tubular breath-sounds were heard in one patient only, and a pleural rub in none. There were 8 cases with finger clubbing, 3 being of the drumstick type, and the remaining 5 showing early changes only. The heart was displaced to the right in 2 cases, and to the left in 2. No alteration was noted in the position of the trachea.

These signs and symptoms in the 46 patients with bronchiectasis in no way differed from those in the 168 chronic bronchitics in whom bronchography was

INCIDENCE OF SYMPTOMS AND SIGNS

Symptoms and signs	Incidence (%)	
	In 46 cases of bronchiectasis	In 168 cases of chronic bronchitis
Cough .. .. .	64	40
Sputum .. .. .	60	35
Dyspnoea .. .. .	68	43
Pain in chest .. .	32	11
Sweats .. .. .	14	5
Loss of appetite ..	0	0
Clubbed fingers ..	17	7

negative, except that in bronchiectasis they were more frequent (see table).

#### RADIOGRAPHY

Only by radiography is accurate diagnosis of bronchiectasis possible in the living subject. In certain forms of bronchiectasis a plain film is difficult to interpret correctly, but all types are generally obvious when bronchography is used.

There were 31 cases of cylindrical, 3 of varicose, and 12 of saccular bronchiectasis. The appearances of cylindrical bronchiectasis seen in the plain film were not sufficiently characteristic to enable a firm diagnosis to be made in many of the cases. The common features were increased lung markings in the form of coarse striæ, sometimes crowded or bundled together and stretching from the hilum to the base. The striæ were situated in the cardiophrenic angle. The outer part of basal zones showed fewer markings than are normally seen and an increased translucency. More rarely a localised zone of increased translucency was present in the middle or outer part of the lower lobe; this change was found to be the one on which most reliance could be placed, because most of the patients showing it were later proved by bronchography to have bronchiectasis. Twining (1938) drew attention to this sign. Other workers state that the branching is irregular; that the normal gradual narrowing of the bronchial lumen is lost; that the bronchi often end at the level of the dome of the diaphragm instead of passing below as they normally do; and that scattered opacities are generally situated in the line of the bronchi. Unfortunately, all the possible appearances that have been described are difficult to dogmatise about unless they happen to be gross, which was seldom in the present group of cases. Moreover, many of the changes can be explained on anatomical and physiological grounds. Thus it is known that the quantity of lung parenchyma in ratio to other lung structures varies, as does the size of air vesicles, in normal persons. Therefore in normal persons of similar build the density varies in the radiograms, which fact will mislead when coarsened striæ and changes of translucency are being assessed, even with a standardised technique of radiography.

Sometimes it is difficult to say that the bronchi are crowded, because, since each bronchus is accompanied by an artery, an appearance of crowding can easily be produced by normal structures. Localised areas of increased translucency, on which most reliance can be placed, can also be produced in the normal lung by deep inspiration. When compensatory emphysema is produced, an adjacent atelectasis should be seen, and such is the case where a whole lobe is involved. If, however, the collapse is in part of one segment of a lobe it cannot be shown radiographically nor is diminution in volume of the lung sufficient to alter the position of neighbouring viscera. Films of many patients with chronic bronchitis—of patients in whom no disease was discovered—showed many of the appearances which have been attributed to cylindrical bronchiectasis, and therefore the plain film should only be regarded as a method of provisional diagnosis.

This conclusion having been reached, it was decided that bronchography was essential before a diagnosis could be made in these cases. Hence the large number of cases in which this procedure was adopted.

#### DISCUSSION

##### *Ætiology*

Statements made by patients are often unreliable, especially when they refer back to infancy and childhood. Thus a history of pneumonia in infancy may well refer to some other acute inflammation. Despite errors of this kind, it is clear that pneumonia plays a leading part in the causation of bronchiectasis. Nehil (1942) found a history of pneumonia in 70% of his cases; in my group a similar history was forthcoming in 56%. Unfortunately I cannot compare these figures with those of normal people, but 32% of the 168 patients in whom bronchiectasis was not found gave a history of pneumonia. Moreover a history of pneumonia was given by the 46 patients with bronchiectasis far more often than that of any other specific infection.

Some confusion exists about the essential changes which take place before bronchiectasis can become established. This is mainly due to textbook statements that bronchiectasis may be ascribed to certain mechanical factors acting on a weakened bronchial wall. Bronchiectasis can be caused in this way, but in most cases the bronchus probably first undergoes mechanical dilatation and while in this state the bronchial wall becomes damaged by infection. The amount of elastic and muscle tissue destroyed by the infection determines whether the bronchus remains permanently dilated or returns to its original diameter when the mechanism which caused the initial dilatation is removed.

If a bronchus is suddenly blocked, the segment of lung which it supplies is shut off from the outside air, and the air contained in the alveoli of the affected part is gradually absorbed by the circulating blood. The segment therefore shrinks, thus increasing the intrapleural negative pressure; and this increase, if long maintained, leads to indrawing of the chest wall, crowding of the ribs, raising of the dome of the diaphragm, compensatory emphysema, and, most important, a shift of the mediastinum to the affected side. Similarly, the occluded bronchus is dilated by the increased intrapleural negative pressure, in virtue of its elasticity.

A patchy atelectasis is a common feature of all forms of pneumonia other than lobar pneumonia caused by types I, II, and III pneumococci. In all these forms the microscopical changes show that the intensity of the infection is directed principally at the bronchi, leading to swelling of the lining cells, stasis of secretion, and damage of the bronchial walls. The result is ordinarily a patchy consolidation with areas of congestion, atelectasis, and emphysema. Often radiography suggests collapse, since the heart is shifted, the diaphragm is raised, and the rib interspaces are narrower.

Lobar pneumonia, proceeding, as it commonly does, to a resolution with complete restoration of structure can seldom cause bronchiectasis. Recent work on its pathogenesis suggests that in a person already sensitised to the pneumococcus a further infection leads to an allergic reaction, consisting of a pouring out of œdema fluid in the air vesicles (Hadfield and Garrod 1942). This fills out the alveoli so completely that no loss of volume occurs in the affected lobe, and consequently no collapse can take place, and therefore the mechanical forces already mentioned do not come into force. Further, though the consolidation spreads by way of the bronchi, these are not affected by the reaction. Radiography shows that no collapse of lung takes place in lobar pneumonia.

#### Reversible Bronchiectasis

If the bronchi in a collapsed lobe are filled with iodised oil they can be shown radiographically to be in a state of cylindrical dilatation. If the collapse passes off soon, the bronchi return to their normal size. Such a bronchiectasis is called reversible. The question arises how long it takes for a reversible bronchiectasis to become irreversible. The answer is important because it affects diagnosis and disposal, as shown in the following case.

A trooper, aged 19, contracted pneumonia in January, 1942. In May, 1942, he was sent to me for examination. His symptoms were a troublesome cough accompanied by a moderate amount of sputum. Bronchography revealed cylindrical bronchiectasis at the left base. The diagnosis of bronchiectasis caused him to be placed in category C. He was disappointed with the disposal because he was anxious to obtain a commission.

In December, 1942, he was again referred to me by his unit medical officer, who reported that his symptoms had improved. Another bronchogram showed that the bronchi had resumed their normal dimensions.

It can be inferred from this history that the affected bronchi became dilated in January and that they returned to normal between May and December. The conclusion is justified that the bronchiectasis remained reversible for several months, but I have not been able to find any published remarks supporting such a conclusion. I therefore think that the possibility that a bronchiectasis may remain reversible for a long time has not received sufficient attention, and that consequently errors in prognosis may arise with cylindrical bronchiectasis.

#### SUMMARY

A group of 211 men and 3 women serving in the Army, who had clinical findings suggesting chronic bronchitis, were bronchographed. Bronchiectasis was found in 46 cases (21%).

The clinical findings did not include any of the characteristic features generally attributed to classical bronchiectasis.

A past history of pneumonia was given in 56% of the patients with bronchiectasis and in 32% of the remaining 168 without bronchiectasis.

Cylindrical bronchiectasis can seldom be diagnosed by plain radiography. Bronchography is essential to confirm and show the extent of the bronchiectasis.

The bronchi in unresolved pneumonia at first undergo reversible mechanical dilatation, which may later be rendered irreversible by secondary infection of the bronchial wall. A bronchus may remain dilated for several months and yet be capable of returning to its original diameter.

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## PROTEIN KATABOLISM IN URÆMIA\* EFFECTS OF PROTEIN-FREE DIET, INFECTIONS, AND BLOOD-TRANSFUSIONS

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THE basic principle of the dietetic treatment of uræmia is the restriction of protein, the energy requirements being supplied from carbohydrate and fat. How far the protein should be restricted has not yet been determined.

According to Fishberg (1944) in acute uræmia a reduction to about 20 g. of protein daily is indicated; in chronic cases not less than 40 g. should be allowed. Thorn (1943) states that patients with a raised blood-urea level respond best to a diet providing 0.5-1 g. of protein per kg. of body-weight; in the presence of azotæmia and œdema, however, a diet consisting of 2000-3000 g. of milk is given. Peters and Van Slyke (1946) think there is no reason to regulate the diet according to the amount of non-protein nitrogen in the blood; the diet of an adult should contain 1 g. of protein per kg. of body-weight. Atchley (1943) considers dietetic treatment of little therapeutic value, "effective protein restriction requiring such an increase in total calories that it is rarely feasible."

Lippman and Persike (1947) report satisfactory results in 12 patients with chronic uræmia with a diet containing 0.5 g. of protein per kg. of body-weight per day. Kempner (1945) treats patients with hypertension as a routine with a rice-fruit-sugar diet providing 2000 calories and containing 20 g. of protein daily; nitrogen balance was maintained for several months and in most cases the non-protein nitrogen level in the blood decreased.

Nearly all workers emphasise that the limitation of protein intake should not be exaggerated, since many patients with renal insufficiency are suffering not only from azotæmia but also from asthenia, anæmia, and hypo-albuminæmic œdema, manifestations connected with a negative nitrogen balance.

From the published reports it seems that the disadvantages of administering appreciable amounts of protein to patients with azotæmia are generally underestimated. In most of the recent papers on acute uræmia dietetic treatment is not even mentioned. Studies on the cause of hyperazotæmia in patients with massive hæmorrhage from peptic ulcer have shown that the blood retained within the digestive tract is totally katabolised within 24 hours—at least in patients with an insufficient calorie intake (Borst 1938). As a rule patients with uræmia have a poor appetite, and unless they are compelled to eat their caloric requirements are not covered. Therefore the intake of 20-70 g. of protein cannot be important in preventing protein depletion in most patients with uræmia, while the 3-10 g. of non-protein nitrogen and the corresponding quantities of potassium and phosphates originating from the ingested protein add materially to the uræmia.

Folin showed in 1905 that a diet consisting of 400 g. of starch and 300 g. of cream reduced the urinary elimination of nitrogen to 4 g. daily in seven days in normal man. Urea and indole were the only nitrogenous substances both relatively and absolutely diminished, creatinine was unaffected by the diet, and uric acid and "undetermined nitrogen" were not reduced in proportion to total nitrogen excretion.

The lowest katabolism in healthy persons can be obtained if practically no protein and enough carbohydrate and fat are given to provide a great excess of calories (Lauter and Jenke 1925, Smith 1926, Krauss 1926). Unfortunately anorexia and vomiting absolutely

\* Based on a paper read to the Nederlandsche Algemeene Ziektkundige Vereeniging at Utrecht on Dec. 21, 1946.

prevent most patients with uræmia from taking a high-calorie diet. The parenteral administration of appreciable amounts of energy-producing food cannot be maintained for long, because the veins cannot stand up to daily injections of more than 50 g. of glucose; one after another they become obstructed by thrombophlebitis, eventually making it impossible even to obtain blood for analysis. Nevertheless, efforts to supply such patients with at least a substantial part of their caloric requirements should not be abandoned. By assiduous nursing they can usually be induced to take a fair amount of carbohydrate and fat by mouth; and, though the daily formation of non-protein nitrogen may not fall to 1 g. per sq. m. of body-surface, as happens on a high-calorie diet without protein, it will be lower than the amount formed during starvation.

The formation of non-protein nitrogen may be increased not only by starvation but also, and to a greater extent, by "toxic destruction of body protein" due to infections (Peters 1944, Grossman et al. 1945), or injuries (Cuthbertson 1945, Howard et al. 1944a and b), by autolysis of injured tissue (Bywaters 1945), and by hæmolysis. Becher (1933) suggested that renal insufficiency might cause an increase in nitrogen metabolism through retention of proteolytic ferments. Peters and Van Slyke (1946) have observed that in patients with nephritis, even without pyrexia, the nitrogen excretion is at times unaccountably large, suggesting "toxic destruction of protein."

Especially in acute uræmia, therapeutic measures sometimes increase the formation of non-protein nitrogen. Thus starvation in acute glomerulonephritis as recommended by Volhard (1942), kidney decapsulation and peritoneal lavage, injury to the erythrocytes by dialysis in the artificial kidney, and transfusions of stored blood may be harmful in this respect.

PRESENT INVESTIGATION

To obtain quantitative data on the effects of our therapeutic measures and of infections on protein katabolism in uræmia, we estimated the daily amounts of urea and ammonia formed in patients with severely impaired renal function. We also studied the effect of certain forms of treatment on the formation of urea and ammonia and on the urinary excretion of total nitrogen and of potassium in a patient with normal kidneys and no evidence of toxic destruction of protein.

The formation of urea and ammonia in a given period can be calculated from the amounts excreted and from the blood-urea levels at the beginning and end of that period. Urea is evenly distributed in the body-water. Since the water content of the blood is about 80% and the water content of the total body about 70%, a change in the blood-urea level of 1 g. per litre is equivalent to a change in the amount of urea in the body of about 0.9 g. per kg. of body-weight. Figs. 1-4 show the daily output of urinary urea and ammonia nitrogen and the daily formation of urea and ammonia in the body. In normal persons the amount excreted is almost equal to the amount formed. In renal insufficiency that relation is absent, but even with normal renal function there is a lag in the output when the formation suddenly increases (see below). The factors governing the distribution of

retained potassium between cells and extracellular fluid being unknown, it was impossible to obtain reliable figures on potassium katabolism in patients with impaired renal function.

Effects of Non-protein Diet and of Blood-transfusion on a Slightly Anæmic but Otherwise Normal Man

Case 1.—A well-nourished man, aged 30, was admitted to the Binnengasthuis on Aug. 28 because of hæmorrhage from peptic ulcer. After the first week no occult blood was found in his faeces. His diet was at first restricted to milk and a gruel made of milk, flour, and sugar, providing 2000 calories, 13 g. of nitrogen, and 108 m. eq. of potassium daily. On Sept. 2 this was replaced by 150 g. of butter and 200 g. of sugar, providing the same amount of calories but practically no nitrogen or potassium. Up to Sept. 25 the diet was qualitatively unchanged, but the quantity varied (fig. 1). On Sept. 25 the intakes of both sugar and butter were reduced to 75 g. daily and a supplement of 1.5 litres of milk was given, which was increased to 2 litres on Sept. 28.

On Sept. 18 a transfusion of 690 ml. of fresh blood raised the hæmoglobin level from 10.6 to 12.6 g. per 100 ml. The patient and both donors were of group O. The transfusion was followed by a slight rigor, but there was no rise of temperature.

During the whole experiment the patient's weight fell steadily, though he was kept in bed and the food intake was sometimes as high as 2800 calories a day.

Fig. 1 shows that the amount of urea and ammonia formed and the amount of potassium excreted, which were rather high in the first period, fell on the third day of

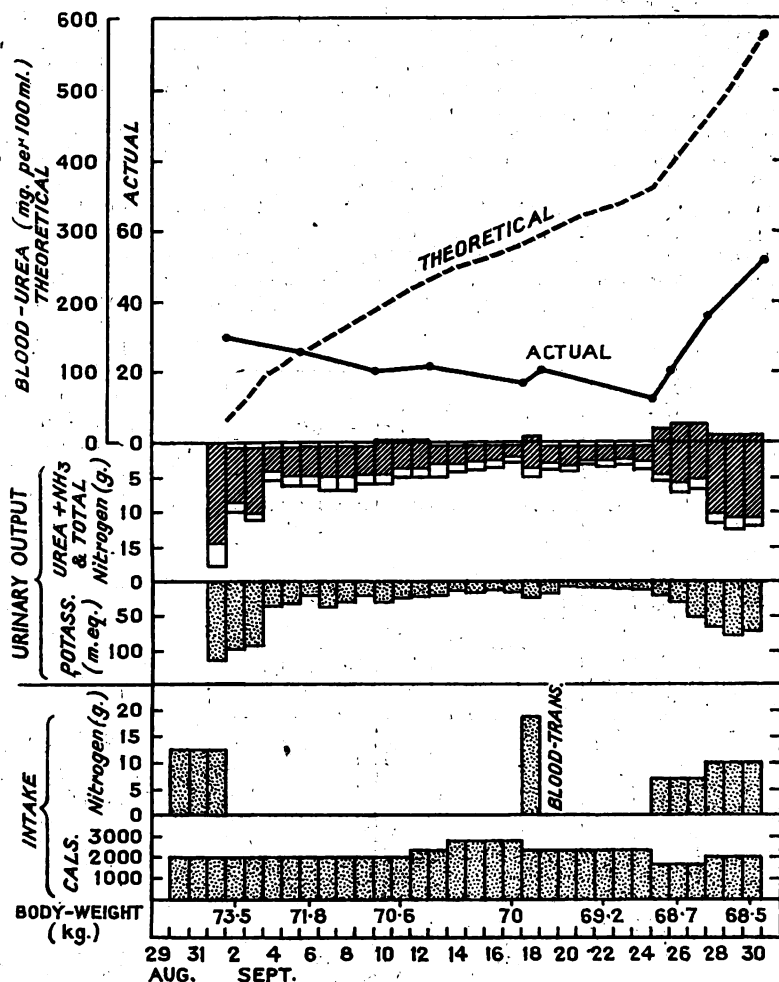


Fig. 1—Effects of non-protein diet and blood-transfusion on a slightly anæmic but otherwise normal man (case 1). At first, as blood-urea level falls, excretion of urea and ammonia exceeds formation; later urea formation exceeds excretion and urea accumulates in body-fluids. Hatched columns represent in all figures the urea and ammonia formed daily.

the non-protein diet to a third of their previous levels, thereafter slowly decreasing to 2.9 g. and 13 m. eq. daily. The blood-transfusion was followed by a slight but definite rise in protein katabolism lasting a day, the increase in urea and ammonia nitrogen and in potassium being 1.5 g. and 19 m. eq.; the transfused blood contained 19 g. of nitrogen and 33 m. eq. of potassium.

On the 23rd day of the protein-free diet the amount of urea and ammonia nitrogen formed was still 3 g. a day—twice that usually found in normal people on a high-calorie non-protein diet.

The protein katabolism promptly increased on the day that the intake of protein was resumed. From the figures for nitrogen excretion it might be deduced that the nitrogen balance then became positive for three days; but, since the rise in the blood-urea level shows that there was a considerable increase in the amount of urea accumulated in the body-fluids, the formation of urea and ammonia exceeded their excretion, making the real nitrogen balance definitely negative.

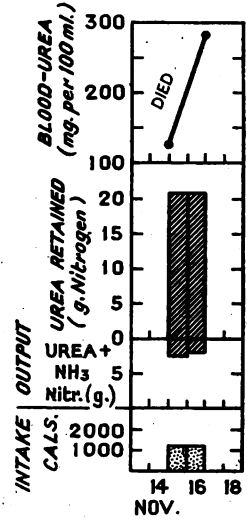


Fig. 2.—Fatal case of acute glomerulonephritis and bronchopneumonia (case 2). Protein katabolism with retention of most of the urea formed.

Since one of the aims of this experiment was to find out whether a rapid increase in the blood-urea to dangerous levels in patients with anuria could be prevented by a normal-calorie non-protein diet, we calculated what the blood-urea level would have been if no nitrogen had been excreted in the urine. These theoretical figures (given in fig. 1 on a different scale from the actual findings) show that after 23 days of protein-free diet the blood-urea would have been only 353 mg. per 100 ml., which is still below the level at which death

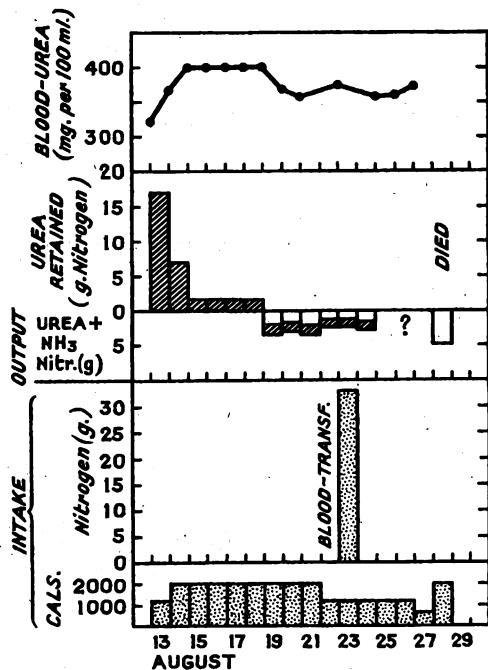


Fig. 3.—Protein katabolism sharply reduced after mepacrine and change in diet. For the period Aug. 15-25 the average amount of urea formed daily has been calculated; an increase of 5 kg. in body-weight due to œdema has been taken into account.

from uræmia is to be expected. The daily ingestion of 1.5-2 litres of milk is sufficient to bring the urea within 6 days to 577 mg. per 100 ml., a level found in uræmic patients only shortly before death. Though the theoretical figures for blood-potassium cannot be calculated, the data on the excretion of potassium justify the prediction that, in anuria during the protein-free diet, death due to potassium retention would not have taken place. The relatively important increase in potassium excretion following a blood-transfusion which was seen in this patient was not found in similar cases.

ACUTE RENAL INSUFFICIENCY

Case 2.—A well-nourished man, aged 36, was admitted to hospital with glomerulonephritis, complicated with pulmonary œdema. He was cyanotic and dyspnoic. During his stay in the hospital his temperature did not exceed 101°F. A diet of butter and sugar was given, but because of the dyspnoea ingestion was difficult and the intake was only 2400 calories in 48 hours. In that period the blood-urea level showed an unexpectedly steep rise from 124 to 281 mg. per 100 ml.

The patient died 12 hours after the last blood examination and 70 hours after admission. Necropsy confirmed the diagnosis of acute glomerulonephritis and pulmonary œdema. The lungs were heavy and distended, but the fluid pouring abundantly from the cut surfaces was turbid and hæmorrhagic. Cultures were positive for pneumococcus type III. Microscopical examination showed numerous erythrocytes and leucocytes in the lung alveoli.

Fig. 2 shows that the rapid rise in the blood-urea level was partly due to renal insufficiency and partly to a considerable formation of urea. Probably the bronchopneumonia developing in œdemic lungs brought about an extensive wastage of protein in the days immediately preceding death.

We were deeply impressed by the disastrous effects of the infection on protein katabolism in case 2, and since November, 1945, all our patients with acute uræmia have been treated with penicillin at the slightest evidence of infection.

Case 3.—A moderately well-nourished man, aged 42, was admitted to hospital on July 31, with acute glomerulonephritis and œdema. On admission the blood-urea level was 128 mg. per 100 ml., and the standard urea clearance was 23% of normal. At first his condition improved on a low-protein low-salt diet. On Aug. 10 his temperature, which had been normal since admission, was 100°F. Next day his blood was found to be heavily infected with tertian malaria and the output of urine dropped sharply to 50 ml., and remained there for some days. On the 14th the urine output ceased. On Aug. 12 and 13 mepacrine 100 mg. was given thrice daily. On the 14th five doses of quinine hydrochloride 200 mg. were given; the malaria parasites disappeared from the blood that day and have never been found again in many examinations.

On Aug. 18 and 23 he was given 750 mg. of quinine hydrochloride and 100,000 units of penicillin as a prophylactic measure.

On Aug. 13 the blood-urea was 310 mg. per 100 ml.; a diet of butter and sugar was given, providing 2000 calories daily. On the 19th diuresis set in and 359 ml. of urine was collected; in the next few days there was no significant increase in the output of urine. From Aug. 14 the patient was definitely uræmic, with drowsiness, restlessness, and muscular twitchings. He was cachectic and anæmic; œdema was considerable; serum-albumin 1.9 g. per 100 ml. On Aug. 22 the amount of butter and sugar in the diet had to be reduced. On the 23rd 400 ml. of plasma and 1 litre of

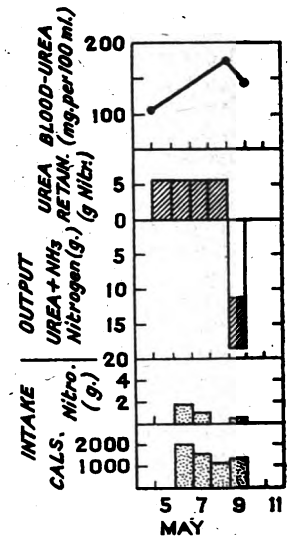


Fig. 4.—Sulphamerazine intoxication and anuria (case 4). Protein katabolism moderate.

TABLE I—FINDINGS IN CASE 5

Date	Blood		Body-weight (kg.)	Urine (mean daily output)	
	Urea (mg. per 100 ml.)	Hb (g. per 100 ml.)		Volume (ml.)	Urea and nitrogen ammonia (g.)
Sept. 21 ..	490	3.9	49.5	900	4.55
Sept. 26 ..	507	4.3	51	436	1.96
Oct. 2 ..	395	8.26	57	478	1.82
Oct. 16 ..	400	9.04	55	482	1.90
Oct. 19 ..	385	10.14	..	445	1.68
Oct. 22 ..	380	11.54	..	289	1.43
Oct. 26 ..	456	10.61	..		

fresh blood were given, bringing the level of Hb from 5.1 to 8.9 g. per 100 ml. By the 25th diuresis could no longer be estimated, as most of the urine was lost in the bed. On the 27th the patient refused to take his food, and we tried to free him from some of his urea with Kolff's artificial kidney but failed through technical difficulties and our lack of skill. Not even half a litre of blood was cleared. Contrary to expectation, on the 28th the patient's condition improved, the diuresis rose to 1 litre, and he was again coöperative; but next morning he suddenly died.

*Necropsy* showed intracapillary and extracapillary glomerulonephritis; ascites and hydrothorax; no bronchopneumonia.

Fig. 3 shows that the blood-urea level rose steeply while malaria parasites were present in the blood; the formation of urea and ammonia must have been considerable. Thereafter the blood-urea remained at the same level, the urea formation being so low that the increase in urea accumulated in the body-fluids was compensated by the increase in oedema. The blood-urea level even fell when urea was again excreted in the urine. The protein-free diet of normal calorie value in this uræmic patient reduced protein katabolism to lower levels than in normal persons. The protein depletion, shown by the low level of serum-albumin and the oedema, may have contributed to this favourable effect. The influence of the blood-transfusion on protein katabolism must have been negligible, since no rise in the blood-urea level nor any increase in the urinary excretion of urea was observed.

**Case 4.**—A tall vigorous man, aged 30, weighing 80 kg., was admitted to the surgical department with ureteral colic on May 4. He had gonorrhœal urethritis and had taken 15 g. of sulphamerazine in three days just before admission. He was referred to the department of medicine 48 hours after the last urine had been passed. Not realising that excessive amounts of sodium bicarbonate and water had already been given in the surgical ward, we administered 26 g. of sodium bicarbonate and 1.5 litres of water. Swelling of the legs and pulmonary oedema developed. The  $\text{HCO}_3$  content of the plasma rose to 43.5 m. eq. per litre, and the patient showed signs of tetany and mental confusion. The diet of butter and sugar had to be supplemented with small quantities of rice and bread to induce him to eat. Nevertheless the calorie intake was inadequate.

On May 7 110 ml. of urine was collected, but in the next 36 hours no urine was passed. On May 8 his temperature sharply rose to 104°F. Radiography of the chest showed a shadowing of both lungs; the medial portions were much more affected than the peripheral ones, giving the typical picture of pulmonary oedema. Immediately 100,000 units of penicillin was administered and next day the temperature was normal. After five days' anuria diuresis set in on May 9, the output of urine rising rapidly.

Fig. 4 shows that the protein katabolism was of the same order in case 4 as in case 1, though in case 4 the calorie intake was definitely insufficient and there was probably an incipient bronchopneumonia, held in check by the penicillin. The rise in blood-urea level being slight, there was no danger of uræmia and no call

for such therapeutic measures as kidney decapsulation, peritoneal lavage, or extracorporeal dialysis of blood.

## CHRONIC RENAL INSUFFICIENCY

**Case 5.**—A woman, aged 30, who had had kidney disease for seven years, was admitted for the second time to the hospital in August, 1946. For the last three months the blood-urea level had never been below 300 mg. per 100 ml., but on Sept. 16 it was 520 mg. per 100 ml. On Sept. 20 there was oedema of the legs and face; and a large gangrenous bed-sore over the sacrum; blood-pressure 120/80 mm. Hg. The patient was drowsy and restless, with muscular twitchings so severe that coördinated movements were hardly possible; her appetite was poor and most of the food ingested was lost by vomiting. Blood-urea 490 mg. per 100 ml., Hb 3.9 g. per 100 ml.; plasma chlorides 69 m. eq. per litre,  $\text{HCO}_3$  22 m. eq. per litre, inorganic phosphorus 21.5 mg. per 100 ml.

On Sept. 21 an enormous swelling of the right side of the face, due to parotitis, developed. Penicillin 100,000 units was injected three times a day. A diet restricted to butter and maltose was given. The patient was compelled to eat, and though at first much of the ingested food was vomited, after some days most of it was retained, providing about 1400 calories daily. In view of the high blood-phosphate and the muscular twitchings, 3 g. of calcium carbonate and 1 g. of magnesium oxide were administered daily.

In a few days the swelling of the face subsided and the ulcer over the sacrum became a fresh red; in two weeks the muscular twitchings had almost disappeared, the patient was again interested in her surroundings, she read the greater part

TABLE II—FINDINGS IN CASE 6

Date	Hb (g. per 100 ml.)	Serum-albumin (g. per 100 ml.)	Body-weight (kg.)	Blood-urea (mg. per 100 ml.)	Urea clearance (% of normal)	Urine nitrogen (g. per 24 hr.)	
						Total	Urea and $\text{NH}_3$
Nov. 14	..	4.85	57.1	82	11.1	3	2.7
Nov. 19	10.8	..	57.8	67	8.5	2.5	2.2
Nov. 25	..	..	58.7	50	9	2.6	1.9
Dec. 2 ..	..	..	59.5	46	9	2	1.4
Dec. 10	11.1	4.6	59.5	41	9.5	2	1.6
Dec. 27	..	..	60	63	8.5	2.5	1.8
Jan. 2 ..	..	..	60	68	7		
Feb. 3 ..	11	4.35	62	79.5	8.8	3.4	2.9
March 6	13	4.75	63	75	8	2.6	2.3
April 15	11.3	5	63	76	6.7	2.5	2.05

of the day, and took over the supervision of the distribution of books and newspapers among the patients of the ward.

Blood-transfusions totalling 2200 ml. of fresh blood raised the Hb level to 10.1 g. per 100 ml. An attempt to improve renal function and correct the blood-chloride level by giving large quantities of saline intravenously met with no success, the urinary excretion of urea continued to be low, oedema increased, ascites developed, body-weight rose from 51 to 57 kg., and blood-pressure rose to 170/120 mm. Hg. In the second week of October the calorie intake decreased as vomiting became more severe. On Oct. 19 convulsions in the left arm developed, recurring frequently in the next 24 hours; thereafter the left arm was paralysed. On the 21st all treatment ended. In the next few days the patient took only some water, fruit juices, and milk, most of which was vomited. She died on Oct. 27.

*Necropsy* showed one aplastic kidney, weighing 30 g.; the other weighed only 70 g. and had a granular scarred appearance.

During the first few days after the beginning of dietetic treatment in case 5, when the parotitis was most severe, the elimination of urea was rather high and the blood-urea remained at the same level (table 1). After the parotitis subsided the blood-urea level fell, though the output of urine and the excretion of urea were much reduced. The increase of oedema accounted for some 10 g. of urea nitrogen; nevertheless during that period

the urea formation must have been as low as 1 g. a day. Obviously in this cachetic woman the protein-sparing effect of the protein-free normal-calorie diet was higher than in normal people. In the following weeks, when vomiting became more severe, the blood-urea level did not change essentially, the 2 g. of urea and ammonia nitrogen excreted daily being almost equal to the amount daily formed by protein katabolism. In the final stage, when dietetic treatment and penicillin injections were abandoned, urea excretion was practically the same, but the blood-urea level rose rapidly, showing an increase in the formation of urea to an equivalent of 5 g. of nitrogen daily.

**Case 6.**—A woman, aged 39, was admitted in October, 1946, in a semiconscious state which had developed in 24 hours. She was known to have had albuminuria since a tonsillitis in her third year. For several years she had had frequent attacks of migrainous headache. In the last year her physical and mental efficiency had decreased.

On admission her blood-pressure was 240/150 mm. Hg, urine contained albumin and an occasional erythrocyte; blood-urea 130 mg. per 100 ml. A strictly salt-free diet of butter and sugar was given, and the patient was induced to drink enough to bring the output of urine to 1.5 litres a day. Her condition rapidly improved. A week after admission her blood-pressure was 160/100 mm. Hg. A gradually subsiding aphasia was the only remaining evidence of her serious condition. Her blood-urea level had fallen to 80 mg. per 100 ml., but the urea excretion was extremely low. Therefore the following diet was prescribed, containing, according to the tables of McCance and Widdowson (1946), only 4 g. of nitrogen, 1280 mg. (33 m. eq.) of potassium, and 470 mg. (15 m. eq.) of phosphorus, and providing 2480 calories:

	g.		g.
Potatoes (boiled) ..	100	Sugar ..	100
Rice, polished (raw) ..	50	Apples or pears ..	200
Flour (80 %) ..	100	Vegetables ..	100
Custard powder ..	25	Cocoa powder ..	10
Cream (20 %) ..	200	Tea infusion ..	500
Butter ..	100	Coffee infusion ..	100

The result was excellent. After her discharge from hospital on Jan. 6, 1947, the patient continued to take the same diet. Every month she visits the outpatient department. She is more able to do her usual work than before her stay in hospital. Since her admission in October, 1946, she has had very few headaches. In March, 1947, after a very busy day, she had an attack of semiconsciousness, followed by an aphasia lasting a few hours. Next day she was well and came to the outpatient department. Her blood-pressure is rising gradually; on April 15 it was 215/125 mm. Hg. Renal function, as estimated by standard clearance, is invariably low. Serum-creatinine on March 6 and April 15, 1947, was 6 and 4.85 mg. per 100 ml. respectively, creatinine clearance 10.2 and 11.9 ml. per min., being about 8 % of normal. There is persistent albuminuria, the loss of protein in the urine averaging 1 g. a day.

In February, 1948, the patient was readmitted because of a sudden unconsciousness lasting 12 hours. The blood-pressure was 250/140. In the last year she had maintained a normal life except for strict adherence to a diet containing not more than 30 g. of protein and 2 g. of sodium chloride. Since September, 1947, she had had profuse menstrual discharge lasting 10 days. In March, 1948, she was in good condition: blood-urea 60 mg. per 100 ml., urea clearance 7.5%, "apparent" creatinine 6 mg. per 100 ml., Hb 9.2 g. per 100 ml. serum-albumin (Howe) 46 g. per litre.

The rise in weight in case 6 despite the absence of oedema suggests a positive nitrogen balance. Accordingly the output of nitrogen in the urine during the patient's stay in hospital was found to be only 50–70% of the calculated intake (table II). The most remarkable fact is the absence of all signs and symptoms of uræmia, anæmia, and hypo-albuminæmia, though the urea clearance and endogenous creatinine clearance are of the same order as in patients in the terminal stage of chronic uræmia.

In the last two years many more patients with renal insufficiency have been treated with a diet containing hardly any protein, potassium, or phosphorus. In all cases a considerable reduction of protein katabolism has been obtained, though calorie requirements were seldom covered. The patients' anorexia and the monotony and

unattractiveness of the diet nearly always prevented an adequate calorie intake for more than four days. We got the best results with a gruel consisting of water 1.5 litres, custard powder 100 g., sugar 150 g., and butter 100 g., providing 1750 calories. When the kidney has not entirely ceased to function, small quantities of potassium are readily excreted, and it is unnecessary to deprive the patients of fruits and fruit-juices.

For protein-depleted patients with chronic renal insufficiency a high-calorie diet is the first essential; no matter how great the intake of protein, a positive nitrogen balance cannot be established if the calorie requirements are not covered. When in our patients the calorie intake was adequate, the addition of 20–30 g. of protein to a previously protein-free diet was not followed by a significant rise in nitrogen katabolism and the nitrogen balance became positive. Moreover, the palatability of the diet was greatly improved by the addition of small quantities of protein.

Hypo-albuminæmia due to massive albuminuria in uræmic patients is not amenable to treatment. Repeated infusions of 1 litre of stored plasma had no effect on protein katabolism; it did not induce a significant rise in serum-albumin level in an extremely protein-depleted patient, though the nitrogen balance became strongly positive.

Infections appeared to have a deleterious effect on all patients with renal insufficiency; even in minor infections protein katabolism was definitely increased.

#### SUMMARY

In normal people a diet containing practically no protein or potassium, and providing an amount of carbohydrate and fat not wholly sufficient to meet calorie requirements, reduces the daily protein katabolism in three days to 6 g. of nitrogen and in fourteen days to less than 4 g. of nitrogen, the daily excretion of potassium being 30 m. eq. at three days and 10 m. eq. at fourteen days. In an anæmic subject, after a transfusion of fresh blood, protein katabolism is only slightly increased.

In patients with uræmia the effects of this diet and of blood-transfusions are similar to those in normal people; if the patients are suffering from protein depletion, protein katabolism is reduced to still lower levels.

Protein katabolism is much increased by infections. To every patient with acute uræmia penicillin should be given as a prophylactic measure.

By the prevention of infections and by dietetic treatment it is probably possible in most anuric patients to postpone a rise of the blood-urea level to dangerous levels for at least three weeks.

Many patients with chronic renal insufficiency and a kidney function as low as 8% normal can maintain an active life on a diet providing an adequate amount of calories and only 25 g. of protein daily.

I am indebted to Dr. R. van Dam, superintendent of the department of morbid anatomy of the Binnengasthuis, for placing the anatomical data at my disposal.

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## MERCURY IN THE URINE OF CHILDREN WITH ACRODYNIA

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In 1945 a child, aged 14 months, with a severe form of acrodynia was observed in the Children's Hospital of Cincinnati. On May 5 a specimen of urine was examined for mercury by means of the di-beta-naphthylthiocarbazono method of Hubbard<sup>1</sup> and 360 µg. of mercury per litre was found; two days later a specimen contained 320 µg. per litre. Since these are appreciable amounts of mercury, the determinations were repeated on May 31 and June 20, when amounts of 90 and 140 µg. per litre were found. The source of mercury could not be established in that child.

Acrodynia is rare in Cincinnati and only 8 additional cases have been seen in the Children's Hospital up to now. Through the cooperation of paediatricians from other cities we were able to examine the urine of 11 more children who had been diagnosed as acrodynia elsewhere. Thus a total of 20 children with the acrodynia syndrome could be studied for excretion of mercury in the urine up to the present time. In the urine of 18 children appreciable amounts of mercury were found, and in some of those who could be followed the excretion of mercury continued for several weeks or even months. As a rule, values of the same order were found in repeated

TABLE I—MERCURY CONTENT OF FIRST SPECIMEN OF URINE EXAMINED IN ACRODYNIA PATIENTS AND IN CONTROLS

Mercury in urine (µg. per litre)	No. of persons:		Mercury in urine (µg. per litre)	No. of persons:	
	Clinically diagnosed as acrodynia	Controls		Clinically diagnosed as acrodynia	Controls
Over 400	2	Nil	51-100	5	1†
301-400	1	"	1-50	3	8
201-300	5	"	0	2*	40
101-200	2	"	Total	20	49

\* Older children. † Child had taken calomel tablets.

examinations of the same patient but occasionally unexplained variations were encountered. From some patients only a single specimen of urine could be obtained.

Of the 20 children in the acrodynia group, 18 were under 4 years of age, the remaining 2 being aged 8 years and 14 years. The patients were in different stages of the disease, the severity of their illness varied, and some of them were treated with BAL following the suggestion of Bivings and Lewis.<sup>2</sup> It is therefore difficult to summarise the results briefly.

In table I the values found in the first determination in the urine of patients diagnosed as acrodynia are compared with those of controls. The controls were mostly children, patients of the Children's Hospital admitted

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for various reasons; but some healthy children and a few adults were included in the control group.

The difference between the two groups is obvious. Of the 20 children in the acrodynia group, 18 had mercury in the urine, and in 15 of them the amounts excreted were over 50 µg. per litre. The 2 children(\*) in whose urine no mercury was found were the older patients, aged 8 and 14 years; they belonged to an age-group in which acrodynia is unusual. Both these cases were atypical in other respects; the girl aged 8 years had

TABLE II—MERCURY CONTENT OF ALL SPECIMENS OF URINE EXAMINED IN ACRODYNIA PATIENTS AND IN CONTROLS

Mercury in urine (µg. per litre)	No. of specimens from:		Mercury in urine (µg. per litre)	No. of specimens from:	
	Patients clinically diagnosed as acrodynia	Controls		Patients clinically diagnosed as acrodynia	Controls
Over 400	5	Nil	51-100	20	2†
301-400	4	"	1-50	23	10
201-300	14	"	0	6	60
101-200	24	"	Total	96	72

† Child had taken calomel tablets.

been ill for three years and the boy aged 14 years was having a third attack of a condition which resembled acrodynia. On account of these unusual features the diagnosis of acrodynia was made with reservation by the physicians of the 2 children. However, we thought it advisable to include these children in the acrodynia group, since it seemed important to emphasise that the symptom complex of acrodynia can occur without excretion of mercury in the urine.

Over 80% of the control cases had no mercury in the urine; of the 8 controls listed in the 1-50 µg. column, 4 had only 10 mg. per litre, a value near the limit of error of the method; and in 3 children who had 20, 35, and 40 µg. per litre respectively in the first sample none or minimal amounts were found in subsequent samples, so that contamination of the first specimens cannot be excluded. In one control child (†) 70 µg. per litre was found in the first urine specimen and in two subsequent samples 40 and 80 µg. per litre was present. We were able to get in contact with the physician who had taken care of this child before admission to the hospital and we were told that the child had received calomel tablets from him. We also observed 3 other children who were treated with mercury preparations and excreted in the urine 50, 70, and 180 µg. of mercury per litre without showing signs of acrodynia. These children are not included in the control series since we selected them knowing of their exposure to mercury. These cases are important since they demonstrate that a child, after treatment with mercurial drugs, may excrete mercury in the urine without signs of acrodynia.

In table II all the values obtained in the acrodynia group are compared with all the values found in the controls and again a significant difference becomes apparent. The two values above 50 µg. per litre found in the control series (†) refer to the child who had received calomel.

### DISCUSSION

In the first cases of acrodynia that we examined, the source of the mercury excreted in the urine could not be ascertained. The parents usually do not know whether or not tablets, ointments, and other medication given to their children contain mercury. But recently a history of the ingestion of calomel, of the application of ammoniated mercury ointment to the skin, or of the use of a "teething powder" containing calomel has been obtained in a number of cases.

The fact that mercury is excreted in the urine of many children with acrodynia suggests that in small children a causal relationship may exist between exposure to and resorption of mercury and the symptom complex of acrodynia. The fact that after mercury medication children may excrete mercury in the urine in appreciable amounts without developing acrodynia suggests that an individual susceptibility (idiosyncrasy) to mercury intoxication exists in the children who develop acrodynia. Since 2 of the older children of our series showed signs of acrodynia without excreting mercury, and since chronic arsenical poisoning sometimes causes an acrodynia-like picture, it seems that the symptom complex of acrodynia can arise from more than one cause.

We have not had sufficient experience in the treatment of acrodynia with BAL to venture judgment concerning this form of therapy.

So far our study of mercury in acrodynia has been on a small scale and progress has been slow. But we hope that in the near future the laboratory facilities for this investigation can be extended and that then some of the outstanding questions will be answered more definitely.

Meanwhile it is recommended that in every case of acrodynia the possibility of exposure to mercury should be considered and investigated, and whenever possible the mercury content of the urine should be determined.

### A PHOTO-ELECTRIC DROP RECORDER FOR INVESTIGATING CARDIOVASCULAR EFFECTS OF DRUGS IN MAN

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DURING a re-examination of the highly controversial<sup>1</sup> question of adrenaline hypersensitivity of the vessels in sympathectomised human limbs, it was found (1) that slight differences in the initial vasomotor tone are of considerable importance in determining the degree of the reaction, and (2) that the slightest difference in the speed and amount of adrenaline administered will produce vastly different results, rendering evaluation extremely difficult.

Our plethysmographic method<sup>2</sup> could give information about the first point. Further, it had been found

1. Ascroft, P. B. *Brit. J. Surg.* 1937, 24, 787. Fatherree, T. J., Adson, A. W., Allen, E. V. *Surgery*, 1940, 7, 75. Freeman, N. E., Smithwick, R. H., White, J. C. *Amer. J. Physiol.* 1934, 107, 529. Smithwick, R. H., Freeman, N. E., White, J. C. *Arch. Surg., Chicago.* 1934, 29, 759.
2. Goetz, R. H. *Brit. J. Surg.* 1939, 27, 506; *S. Afr. J. med. Sci.* 1943, 8, 65; *Amer. Heart J.* 1946, 31, 146.

important that the subject should not be aware of the injection, because psychic changes in vasomotor tone will modify the reaction in the non-sympathectomised limb to such an extent that even with the greatest care it is extremely difficult to compare the reaction of the normal with that of the sympathectomised limb to physiological doses of adrenaline. Therefore adrenaline was given by intravenous drip in the following way:

Two 'Vacoliters,' one for normal saline and the other containing 1 in 500,000 adrenaline, are set up (fig. 1) and connected via a two-way tap to the intravenous needle. After insertion of the needle saline is given at a rate just sufficient to prevent clotting in the needle. By merely turning the tap it is possible to switch over from saline to adrenaline without the patient being aware of the change. Thus any psychic vasomotor reactions when starting the administration of adrenaline can be eliminated.

However, it was soon discovered that, when a vaso-constrictor substance, such as adrenaline, is injected into a vein, the vessel—owing to the direct effect of the drug on its wall—may contract to such an extent that the rate of drops decreased considerably. This makes it difficult to administer adrenaline (for instance) at the same rate continuously, and experiments showed that, unless this was done, it was impossible to get comparable results and to reach reliable conclusions. This difficulty was overcome by increasing the height of the bottle containing the adrenaline, and thus increasing the pressure under which it was administered (fig. 1). It was essential, however, to devise some method by which the drops could be recorded on the film as the experiments were carried out; therefore the drop recorder now to be described was developed.

An intravenous drip is fitted in an ebonite block (fig. 2), in which an electric-light globe, fed from a dry battery or a

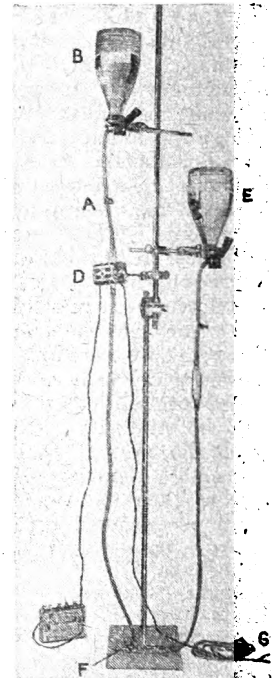


Fig. 1—Apparatus for intravenous drip set up with drop recorder: A, clip; B, test solution; D, drop recorder; E, saline; F, two-way tap with intravenous needle; G, lead to galvanometer.

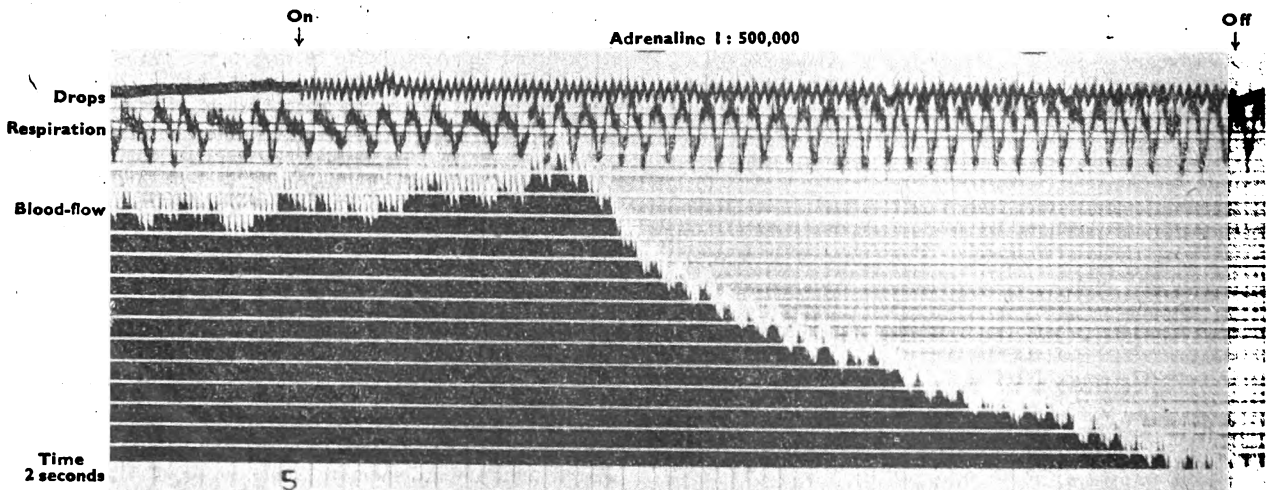


Fig. 3—Typical plethysmogram obtained with drop recorder when adrenaline 1 in 500,000 (18 drops per ml.) was given.



bell transformer, is fitted opposite a photo-electric cell 10 x 5 mm. of the rectifier type connected via a shunt box to a galvanometer. The light of the globe passes through a channel and the centre of the intravenous drip to meet the surface of the photo-electric cell. As the drops fall the beam is interrupted, and the interruption is recorded by the photo-electric cell (fig. 3).

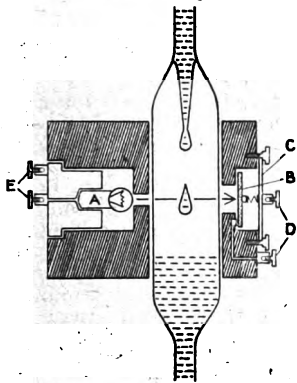


Fig. 2—Intravenous drip set up in ebonite block with drop recorder: A, electric-light globe; B, photo-electric cell; C, casing with contact spring in centre; D, terminals connecting with galvanometer; E, terminals connecting with 2.5 volt battery.

Fig. 1 shows the photo-electric drop recorder in place. The clip regulating the number of drops, A in this figure, should be fixed immediately above the Murphy drip. During the experiments it was found that, on turning the two-way tap from the test solution over to saline, some drops still fall through the drip. Therefore an artery forceps is used to clamp the tubing at a point just above the

regulating clip at the moment when the two-way tap is being turned over to saline.

Fig. 3 is typical of the tracings obtained when adrenaline 1 in 500,000 was given. The drop recording on the top of the tracing is clearly shown, and the serration of the black line allows exact counting of the drops administered. The reaction of the peripheral circulation, which sets in 34 sec. after the start of the infusion, is clearly seen in the plethysmogram, demonstrating a well-marked diminution in both digital and pulse volume. Note also the effect on the respiration.

Slightly modified, this apparatus can also be used in experiments on animals for recording the venous outflow, glandular secretion, or other phenomena to be counted in drops, in conjunction with other photographic recording methods.

I am indebted to Mr. G. Hall, technical assistant in the department of physiology, for making the apparatus.

## THE UNSTABLE SEMILUNAR BONE

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AN unusual displacement of the carpal semilunar bone is described, and opportunity is taken to explain on morphological grounds why this bone is the most unstable of the carpal series.

A man, aged 71, attended the casualty department with a painful swelling of the right wrist. On the previous day he had been using a heavy scraper to clear tar from an iron staircase. The tool consisted of the scraper attached to a long metal handle, which is used with two hands. The left hand steadies the shaft, while the end of the handle is held in the palm of the right hand to provide the thrust. It was at one of these downward thrusting actions that he felt a sudden violent pain in the right hand. The swelling appeared almost immediately.

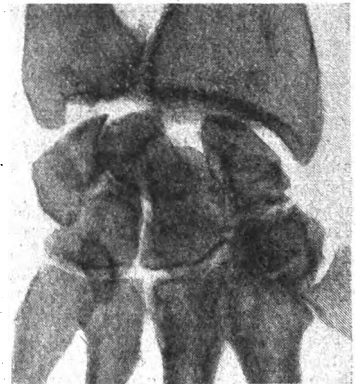
He had been a miner for 55 years before his present job, which as a general labourer he had held for 3 years. At no time during his long working career had he had any disability from his hands.

He was a stocky well-built man, looking much younger than he was, with nothing of note in his general condition. The swelling of his right wrist was mainly confined to the proximal end of the carpus. Tenderness, which was not excessive, was diffuse, without particular localisation to any one carpal bone. Movements of the wrist were painful and

restricted. Both flexion and extension were about a quarter of the normal. Abduction and adduction were practically absent. Radiography showed widespread osteo-arthritis changes throughout the carpal joints and an unusual medial subluxation of the semilunar bone. The semilunar and cuneiform bones were displaced medially, with the semilunar also rotated through its perpendicular axis (see figure). Lateral and oblique radiographs showed no associated anterior or posterior subluxation.

No attempt at reduction was made, and the wrist was immobilised on a cock-up splint. After a fortnight all pain, swelling, and tenderness had subsided. Flexion and extension were now about three-quarters normal. Abduction and adduction had also recovered and were comparable with those of the opposite wrist. Radiography showed no change. After a further two weeks' physiotherapy the patient returned to work quite satisfied with his wrist.

A medial subluxation of the semilunar bone appears to be rare, despite the fact that the semilunar bone is the most unstable of the carpal bones owing to its shape and position. A study of the carpus, especially its morphology, makes it more remarkable that a medial dislocation does not occur more often. Though it is considered to be the central bone of the proximal row of the carpus, it by no means occupies a true central position. It lies beneath the os magnum but tilted to the medial side and rotated through an axis perpendicular to the carpus. The ossific nucleus appearing in early life lies medially displaced away from the central position, showing this position to be part of the basic human pattern.



X-ray photograph showing osteo-arthritis of wrist with medial subluxation of semilunar bone.

This medial shift and tilt of the human semilunar and its consequent instability are due to the morphological changes which have taken place to form the human pattern.

The primitive carpus consists of a distal row and a proximal row, with the os centrale occupying a central position. With the specialisation of the individual digits and adaption to function, great evolutionary changes can be traced. Instead of the five carpal bones occupying the distal row beneath the respective metacarpals, the fourth and fifth fuse to form the unciform bone. The third enlarges to produce the os magnum, and first and second the trapezium and trapezoid. The os centrale migrates to the radial side, being squeezed out by the elongating os magnum. This position is present in the primates and very early in foetal life, where a tiny cartilaginous nucleus representing the os centrale can be seen, articulating with the distal pole of the scaphoid. The human scaphoid absorbs the os centrale to provide a better foundation beneath the thumb and index finger. With this development and enlargement of the scaphoid the semilunar and cuneiform are displaced medially. The semilunar is no longer securely locked in a ball-and-socket position between the os magnum and the radius. It now occupies a more medial and unstable position centred over the radio-ulnar joint. Its dorsal surface is reduced in size, and its articular facet for the os magnum lies oblique. All these factors contribute to its instability and explain how pressure through the os magnum can so readily produce dislocation of the carpal semilunar.

## Reviews of Books

### The Background of Therapeutics

J. HAROLD BURN, M.D., F.R.S., professor of pharmacology, University of Oxford. London: Oxford University Press, 1948. Pp. 367. 22s. 6d.

Professor Burn describes this book as a series of chapters written for those engaged in teaching clinical medicine, but in fact it is a remarkably interesting work which should by no means be restricted to teachers. Clinical medicine today, he thinks, greatly needs young people trained for at least two, and preferably for five, years in the laboratory, and one of his aims in writing is to encourage the research mind. In explaining how drugs act and what they may scientifically be expected to achieve, he will earn the gratitude of clinicians, who find it harder and harder to keep pace with the advances in therapeutics—even though more and more dangers result from the inexpert handling of drugs. The 18 chapters all show the same critical, lucid, and forcible style. Such subjects as the use of BAL and its mode of action demand a fair knowledge of pharmacology and physiology, but other chapters such as those on obesity, on iron and calcium, and on statistics, are instructive even to the inexperienced reader. Few recent books will give so much pleasure to the thinking doctor.

### The Metabolic Brain Diseases and Their Treatment

By G. TAYLEUR STOCKINGS, M.B., D.P.M., late deputy medical superintendent, City Mental Hospital, Birmingham. London: Baillière, 1947. Pp. 262. 16s.

To explain the psychoses, or at least to present the sceptic with a rational basis for the treatment in vogue today, Dr. Stockings attempts to bring together some aspects of what is known of the function of the brain. Though the attempt is a brave one, it is also, at our present stage of knowledge of the biochemistry of brain, exceedingly rash. Ignoring the whole field of neuropathology, he calls all those behaviour disorders which some think have a physical basis, but which some think entirely due to environmental factors, metabolic encephalopathies. He then divides this hypothetical disorder of brain chemistry into Dysglycic Encephalopathies (Dysglycemia) which includes the field of schizophrenia and most of its variants, and Dysoxic Encephalopathy (Dysoxia) which includes the affective disorders. From this he takes knowledge by the forelock and replaces convulsive therapy by anoxic therapy.

It is true that the physiological work of Quastel, Gellhorn, and Himrich has added to our understanding of the more simple and overt processes in brain chemistry. It is also true that the therapeutic stabs in the dark used in modern psychiatry have a physical basis and may be successful in achieving their object. But the arguments advanced here seem to have little scientific justification. Many feel that the psychoses and neuroses will be shown to have specific causes or contributory causes based on discrete chemical or physical disorders in brain function. Most realise that the life situation must modify the effects of these disorders, and some hold the environmental patterns of the patient's life to be all-important. Dr. Stockings has cloaked our ignorance in a mantle of tortuous argument.

### Telepathy and Medical Psychology

JAN EHRENWALD, M.D. London: Allen & Unwin, 1947. Pp. 212. 12s. 6d.

Prof. J. B. Rhine used large statistics to show that extrasensory perception occurs; Dr. Ehrenwald, at the other extreme, relies on clinical experience and single incidents for factual support as he speculates about the nature of telepathy and its bearing on normal personality as well as paranoid schizophrenia. His argument is temperately developed, but radical. Accepting telepathy as sufficiently proved, he questions whether a paranoid delusion expresses the patient's telepathic awareness of repressed desires on the part of the supposed enemies. He concludes that it is so, and that in schizophrenia heightened perceptiveness of what goes on in the mind of other people is a consequence of the morbid process at work; normality requires that, except at rare moments of fatigue or emotional upheaval, we

shall have no conscious "heteropsychic" knowledge of others' minds. Dr. Ehrenwald expounds a "scatter theory" to account for the approximate and inexact nature of telepathic cognition; he examines the characteristics of mediums and other persons gifted in this direction, and discusses telepathy in dreams. He puts forward an original conception of personality as the outcome of a struggle to exclude extrasensory along with other repressed material from consciousness, in order to preserve the unity and coherence of the self.

The main theme of the work is cogent: if we accept the evidence of Rhine, Soal, Carrington, Tyrrell, and others about extrasensory perception, we must desist from blandly assuming that patients who pretend to telepathic powers are necessarily deluded; furthermore, if we accept their claims in any instance, we shall have to revise the psycho-analytic explanation of such paranoid symptoms. Dr. Ehrenwald's clinical examples, however, are illustrative rather than convincing; he makes too little allowance for that heightened perceptiveness, more familiar than the one he postulates, which can read much from an unguarded look, a gesture, and a tone of voice; and he is surely expressing a fallacy when he says, in his concluding chapter, that the gap between physical (i.e., physiological) and psychological happenings is essentially of the same nature as that between "heteropsychic" awareness and the underlying physical phenomena (of which we have not even an inkling).

The thoughtful final chapter of Dr. Ehrenwald's interesting work contains a warning that telepathy "can only be reconciled with our familiar world picture at the price of throwing some of our cherished concepts of a strictly individual cerebral localisation of mental processes, and perhaps of causality within the field of psychology in general, overboard."

### Slit Lamp Microscopy of the Living Eye

(2nd ed.) ALFRED VOGT, professor of ophthalmology, University of Zurich. Zurich: Schweizer Druck und Verlagshaus. London: H. K. Lewis. Vol. III. Pp. 1058. £16 10s.

Alfred Vogt died in 1943, shortly after he had completed the revision of his classical work in three volumes on the slit-lamp microscopy of the living eye. Begun in 1919, the work covers a period of over 20 years of his life, and it was just before this period that Gullstrand's invention of the slit-lamp had made possible the minute examination of the conjunctiva, cornea, anterior chamber, iris, lens, and vitreous in the living state. The first two volumes contained the technique of slit-lamp microscopy and the atlas of microscopic findings in the cornea and lens. The present volume is the third, and the only one to be translated into English. This, the second edition, contains Vogt's microscopic work on the iris, vitreous humour, and conjunctiva.

Towards the latter part of his life he became especially interested in the manifestations of heredity in ophthalmology, particularly as displayed in twins. The latter part of the volume is given up to this subject, part of it—an appendix on the twin pathology of senile cataract—being designed to be read in conjunction with volume II. Nearly a thousand paintings are reproduced, each with a full case-history attached; tumours of the iris and diabetic changes in the anterior part of the eye are beautifully illustrated. Many of the observations were original when first described and carry Vogt's name. He also became interested in tuberculosis of the iris, on which a chapter is included. The work will stand as a monument to his acute powers of observation, and the fine artistry which set them down on paper so accurately.

Midwifery (8th ed. London: E. Arnold, 1948. Pp. 560. 20s.).—"Ten Teachers" is a well-tryed textbook which performs the phoenix rite every few years with notable success. It is edited, and partly written, as usual by Mr. Clifford White, assisted by Mr. Frank Cook and Mr. William Gilliatt, and it carries the contributions of seven other distinguished teachers. The book is an example of genuine team-work, for the writers have advised one another on the various sections, and galley proofs have been freely amended at a series of meetings attended by all of them. The book thus represents the best agreed practice in London.

# THE LANCET

LONDON: SATURDAY, MAY 29, 1948

## The Medical Curriculum

EVERYBODY agrees that the medical curriculum has become unsatisfactory, and many believe that the doctors of recent generations have actually been given a worse training than their predecessors. Our failure to improve it is generally ascribed to vested interests, but has also deeper causes. The faults so generally deplored, such as the excess of detail, have not appeared spontaneously, but develop from the fundamental plan or system. To alter this system demands a reorientation of thought which is bound to be disturbing; and unluckily some of those who are most conservative about education are to be found among the younger teachers.

Comparing successive contributions to this subject, such as THE LANCET articles in 1932,<sup>1</sup> and the recommendations of the Royal College of Physicians and the Goodenough Committee in 1944, the progress of ideas is obvious. Each attempt displays more clearly the way in which the defects of practice spring from defects in the general principles of medical education. The two latest contributions, a book by Dr. FRANGCON ROBERTS<sup>2</sup> and a Report from the British Medical Association,<sup>3</sup> reflect in particular a growing feeling that what is wanted is the reintegration of medicine with the sciences on which it depends. The B.M.A. Committee (over which Prof. HENRY COHEN presided) urges the integration of botany with zoology, of anatomy with physiology, of physiology with biochemistry, and of the clinical subjects with one another in "general admission wards." Dr. ROBERTS seeks the integration of the departmental specialties, though he feels that the only means of attaining this is a widening of our knowledge of physical principles and the properties of living matter—a demand which seems to offer little immediate hope. In the United States the idea of integration has been carried yet further in the suggestion that the whole of medicine should be synthesised with the premedical and preclinical sciences into one subject: and such a possibility is not lightly to be dismissed, since it would presumably preserve the student's interest and enthusiasm and eliminate superfluous detail. Dr. ROBERTS and the B.M.A. Committee cling to the traditional division of the curriculum into three periods, and so no doubt will the rest of us. But although it is familiar and looks so logical on paper, this division does not accord with the principles of education as seen by educationists. Experimentally at least, might it not be worth facing the labour and mental discomfort involved in modifying the sectional system? There are already signs that the objections to a vocational teaching of the basic sciences are giving way. When, as at present,

physics, chemistry, and biology are taught as independent subjects, and not as directly related to medicine, the student is liable to consign them to oblivion as soon as they have served his purpose in getting him over an examination hurdle. Paradoxically, they are apt to lose much of their educational value from the very fact that they are not taught vocationally.

A significant and controversial point in the B.M.A. report is its insistence that medical students should not be trained as general practitioners but should be given a common foundation on which they can build any form of medical practice. If this assumption is granted, it follows that the more carefully this basic foundation is thought out, the sooner the curriculum can be reformed; and the committee deserves thanks for the specific proposals it offers. It has had the courage to say definitely that the premedical examination should not be taken from school, and that the prospective doctor should use the whole of his school career for obtaining a liberal and general education. Dr. ROBERTS, who says the same thing, emphasises especially the need for an intensive study of English, and he gives practical demonstration of the advantage of writing well. Like the B.M.A. Committee, he thinks that medical teachers should be trained in teaching methods, and should be appointed because of their ability to teach—not their ability for research. Both books, again, urge that elementary teaching should be undertaken by senior teachers. There are of course many topics on which they differ: Dr. ROBERTS, writing for himself alone, sometimes gets down deeper towards solutions; whereas the B.M.A. report, as the work of a committee, tends to be more detailed and precise. But each contribution is full of wisdom and contains much that every teacher will applaud. Each also contains many things which will cause the teacher and examiner to search his heart.

More and more it is recognised that the most potent educational influence is responsibility. The B.M.A. Committee indicates that it is the element of responsibility which gives special value to the year's internship that is to follow qualification and precede registration. Dr. ROBERTS rightly points out that the student attaches much more importance to his case-notes if he believes that these are destined to become the permanent hospital record; and it is significant that many teachers have found that students become unwilling to make their own clinicopathological investigations (e.g., blood-counts) when their findings are ignored in favour of those of the pathologist. This is merely one instance of the need for a sense of responsibility to make an educational exercise valuable. Dr. ROBERTS emphasises the value of the Dalton system, while the B.M.A. Committee says that the student should take an active rather than a passive part in clinical teaching, by presenting and arguing the case himself. Both opinions are evidence of a move in the same direction, away from spoon-feeding, towards doing and thinking. It is a reversion to the lost apprenticeship system.

If everybody admits that the present curriculum is unsatisfactory, it is still hard to agree on what should be done. This being so, should not doctors, who boast themselves scientists, endeavour to apply the experimental method? As Dr. ROBERTS says,

1. What is wrong with the Medical Curriculum? *Lancet*, 1932, i, 1269 et seq.  
 2. Medical Education. By FRANGCON ROBERTS, M.D. London: H. K. Lewis, 1948. Pp. 172. 12s. 6d.  
 3. The conclusions of this report are summarised on p. 839.

"routine offers the path of least resistance and is easier than experiment"; and the B.M.A. Committee remarks that "too often criticisms and suggestions have been based solely on opinions and impressions; only by educational experiment will the answers to many problems of the medical curriculum be forthcoming." Dr. ROBERTS quotes Sir FRED CLARKE as saying that any higher professional school should have autonomy in determining its own needs and methods. Is it not time that the authorities actively encouraged medical schools to apply the experimental method and to investigate by experiment the efficacy of different forms of medical education?

### Urethane for Leukæmia

WHEN the first clinical report on urethane in leukæmia was published in 1946, by PATERSON and her colleagues in Manchester and London,<sup>1</sup> urethane had been known to chemists for over a century. Its hypnotic effects were described by SCHMIEDEBERG in 1885, but its property of interfering with cell mitosis was not recognised until WARBURG in 1921 observed that it would suppress division in sea-urchin eggs. DUSTIN and his associates in Belgium explored this property further, but it was because HADDOW and SEXTON,<sup>2</sup> studying the effect of urethane on transplanted animal tumours, found that one particular type of rat carcinoma was suppressed, that urethane was tried in human malignant disease and leukæmia. Urethane has, unfortunately, no detectable effect in human malignancy, but in leukæmia encouraging results were obtained, especially in the chronic myeloid form—the total-leucocyte count fell to normal levels, immature cells being particularly reduced, the hæmoglobin rose, and the patient's general condition improved. However, one of the patients reported by PATERSON et al. developed a fatal aplastic anæmia which they ascribed, at least in part, to the urethane.

Urethane can be given by mouth and is obtainable everywhere. Trial was therefore easy and reports have appeared from many sources, but the numbers of cases described are small. BOUSSER and others<sup>3</sup> in Paris had good results in one case of chronic myeloid and one case of chronic lymphatic leukæmia; they gave this latter patient 5 g. daily by the intravenous route. Several reports have come from Denmark and a collective account<sup>4</sup> showed that two-thirds of patients with chronic myeloid leukæmia and half of those with chronic lymphatic leukæmia improved. From Switzerland results have been published by KARTAGENER<sup>5</sup> and MARINGER,<sup>6</sup> and by MOESCHLIN,<sup>7</sup> who gave 4 g. of urethane daily to 6 normal people and found that the lymphocytes were reduced; when studying the marrow changes in patients with chronic leukæmias treated with urethane he noted that mitoses in the leucocytes were fewer, but those in the erythroblasts were increased. In Germany SCHULTZE et al.<sup>8</sup> gave urethane by mouth, by rectum,

and intravenously in doses of 0.25–6 g. daily. They noted the extraordinary variation in the time needed for the blood picture to become more normal and the anæmia to be relieved—in 12 cases of chronic myeloid leukæmia the period ranged from 4 to 67 days and the total dose of urethane ranged from 0.5 to 193 g.—and they confirmed that the drug is most effective in chronic myeloid leukæmia and useless in the acute leukæmias. A Polish report<sup>9</sup> on 5 successfully treated patients with myeloid leukæmia warns us that if urethane is given for too long agranulocytosis may result, and an example of this is described by WEBSTER<sup>10</sup> of New York. A man of 59 with a typical mild chronic myeloid leukæmia had at first been treated by radiotherapy; when he relapsed he was given 3 g. of urethane daily, and after 39 days' treatment, when he had received 117 g., he developed hæmorrhages, though his white-cell count was 24,000 per c.mm. and his hæmoglobin 80%; a fortnight later he was dead, and his last white-cell count was 200 per c.mm. with no granulocytes to be seen.

Another series is reported by HIRSCHBOEK and co-workers,<sup>11</sup> who gave urethane to 22 cases of various leukæmias and to 2 patients with Hodgkin's disease and 1 with giant follicular lymphoblastoma. They found that the drug was valueless in these lymphomatous diseases and that it did not affect the course of acute leukæmias even though the total white-cell count might be reduced. As before the best results were in chronic myeloid leukæmia, where the myelocytes and promyelocytes in the marrow showed degenerative changes similar to those seen in agranulocytosis and were the first to disappear from the blood. Some patients can take urethane without discomfort; others develop a troublesome nausea and even vomiting. HIRSCHBOEK and his co-workers think that when this nausea appears early in the course of treatment it is due to gastric irritation, but later it may be a sign of overdose. They used enteric-coated capsules to overcome the early nausea, but these failed later on and then the urethane was given intramuscularly in 50% solution up to 2 g. three times daily with minimal discomfort. BERMAN and AXELROD<sup>12</sup> reviewed the results of urethane treatment in 90 cases of various malignant diseases and leukæmias and they described their own experience with a few cases of leukæmia and malignant diseases in which the clinical results resembled those of others. Their bone-marrow biopsies showed that the marrow picture tends to become more normal, but that overdosage may reduce the bone-marrow elements to pathologically low levels, megakaryocytes alone escaping; liver biopsies showed that even when the peripheral blood of 2 leukæmic patients had become much more normal the leukæmic infiltrations were unaffected, but in a patient diagnosed as "leukæmic reticuloendotheliosis" urethane treatment was followed by disappearance of the areas of infiltration and their replacement by collagenous tissue.

Urethane has received more attention from Continental workers than in England or the U.S.A. This is because English and American workers have

1. Paterson, E., Haddow, A., ApThomas, I., Watkinson, J. M. *Lancet*, 1946, 1, 677.  
 2. Haddow, A., Sexton, W. *Nature, Lond.* 1946, 157, 500.  
 3. Bousser, J., Coblentz, B., Brochen. *Bull. Soc. méd. Hôp. Paris*, 1947, 63, 322.  
 4. *Ugeskr. Laeg.* 1947, 109, 102 et seq.  
 5. Kartagener, M. *Schweiz. med. Wschr.* 1946, 76, 821.  
 6. Maringer, S. *Ibid.*, 1947, 77, 114.  
 7. Moeschlin, S. *Helv. med. Acta*, 1947, 14, 279.  
 8. Schulze, E., Fritze, E., Muller, H. H. *Dtsch. med. Wschr.* 1947, 72, 371.

9. Aleksandrowicz, J., Wolanski, A., Blicharski. *Przeg. Lek.* 1947, 3, 496 (quoted *Aba. World Med.* 1948, 3, 283).  
 10. Webster, J. J. *J. Amer. med. Ass.* 1947, 135, 801.  
 11. Hirschboek, J. S., Lindert, M. C. F., Chase, J., Calvy, T. L. *Ibid.*, 1948, 136, 90.  
 12. Berman, L., Axelrod, A. A. *Amer. J. clin. Path.* 1948, 18, 104.

been able to obtain nitrogen mustards, whereas these have been unobtainable on the Continent. Those who have used both—though adequate figures are lacking—say that the nitrogen mustards give better results; the patients respond more rapidly and more certainly, induced remissions last longer, enlarged lymph-glands and spleen respond much more often, and mustards have been successful in Hodgkin's disease.<sup>13</sup> Nevertheless urethane has the advantages of being cheap and plentiful, it can be given by mouth and requires no special technique of intravenous administration, and many patients can take it without any unpleasant toxic or side-effects. But patients who are being given urethane must still be under proper supervision, and regular blood-counts are needed. Agranulocytosis is clearly very unusual, but it has to be watched for; treatment should therefore be given in interrupted courses and not continuously. With these precautions, urethane may well have earned a place in the treatment of chronic myeloid leukaemia, and it offers an alternative when, for one reason or another, radiotherapy or nitrogen mustard treatment cannot be arranged.

### Regional Ileitis

THE pathology of regional ileitis (Crohn's disease) remains a mystery. The records of 1127 cases described in English publications in 1939-44, and of more than 500 treated at the Mayo Clinic since 1932, point to a general conclusion that the disease is at least inflammatory. Its relation to tuberculosis is not yet clearly determined and its relation to ulcerative colitis may in the end prove closer, for R. B. CATTELL, at the Lahey Clinic, has seen 15 patients in whom regional ileitis and ulcerative colitis either followed one another or were coincidental. Thickening and œdema of the bowel wall, stenosis, and ulceration are the cardinal features of regional ileitis, correlated primarily with a hyperplasia of the lymphadenoid tissue in the submucosa of the ileum. Lymphœdema and a cellular response in the germinal centres, producing the nodules of lymphadenoid tissue, follow and giant-cell systems result, which subsequently become inactive and are transformed from the centre outwards into a mass of reticulum and young collagen. These lesions may be reproduced in the lymph-nodes but caseation does not occur, nor have animal-inoculation tests proved that they are tuberculous. There is no concrete evidence that these changes are similar to those of Boeck's sarcoidosis, and the absence of skin eruptions, swelling of fingers or toes, lymphadenopathy, or uveoparotid syndrome in the clinical histories of patients with regional ileitis makes it unlikely that the two conditions are closely related. More investigation is certainly required, and the distribution of the disease is an important outstanding problem. Does regional colitis arise from the same process; and what is the explanation of the cases of ileitis—involving either the terminal ileum or the jejunum and ileum—with "skip" areas of normal bowel intervening between the affected parts? Injection of ground-up tissue from cases of regional colitis into the bowel wall of pigs has produced ulcerative colitis, but up to now ileitis has not been so success-

fully reproduced in animals. That lymphatic obstruction plays some part was demonstrated by REICHERT and MATHES,<sup>1</sup> but the origin of the obstruction is still undecided. There may be grounds for the belief that this disease, like ulcerative colitis, is a manifestation of an overactive response to an infection, and that its course is determined by emotional and other factors that differ from case to case; 25% of cases occur in Jews, and the commonest age at onset is 20-40 years, when the economic struggle for existence is fiercest.

The symptoms and signs are variable, but abdominal pain, loss of weight, a palpable tumour, and the signs of chronic obstruction are the main ones. Diarrhœa is of serious import and it may give rise to the minor lesions leading to fistula-in-ano, which has long been associated with regional ileitis, though the histological picture in the fistulous tracks is not in any way specific. Internal fistulæ are of quite different character, and these may produce symptoms, such as pneumaturia, which help greatly in establishing a diagnosis. X-ray evidence may clinch the matter—dilated loops of small bowel containing fluid and gas, taken in conjunction with the "string" sign of KANTOR, irregularity of the cæcal outline, and rigidity of the terminal loop of ileum, which fills on barium enema because the ileocæcal valve is incompetent.

There is no general agreement on treatment, but short-circuiting operations with exclusion are increasingly favoured. GINZBURG and GARLOCK<sup>2</sup> prefer this procedure to resection, which CROHN and his co-workers originally advocated. The results of many surgeons with resection, however, have yet to be offset by more promising reports on the alternative measures. BLACKBURN and colleagues,<sup>3</sup> among others, have declared in favour of resection, but recurrence of the disease in 3 of their 22 resections leaves the issue open. Anastomosis between ileum and transverse colon without exclusion, has resulted in the disappearance of some of the inflammatory masses in this condition, but division of the bowel and exclusion of the affected segment seems the more logical treatment. Fæcal fistulæ have often closed after a simple ileocolostomy and some surgeons have then undertaken a second-stage resection, but this interval has as a rule led to incomplete subsidence of the inflammatory process. Recurrences tend to arise within two years, though exacerbations after longer remissions are not rare. The claim that jejuno-ileitis of the diffuse variety is best treated medically may well be justifiable, and the same may apply to the cases where both small and large bowel are involved. The localised variety in the terminal ileum, on the other hand, seems to be a surgical problem, and the supervention of obstructive symptoms will necessitate operation. In the obstructed phase, ileocolostomy with exclusion seems to be the operation of choice for these cases, but when a clearly localised length of bowel is involved and there is an area of mesentery that can satisfactorily be taken with it, resection will give good results. The danger that such operations will be followed by a deficiency state resembling idiopathic sprue, with fat in the stools, anæmia, weight loss, and

1. Reichert, F. L., Mathes, M. E. *Ann. Surg.* 1936, 104, 601.

2. Ginzburg, L., Garlock, J. H. *Ibid.*, 1942, 116, 906.

3. Blackburn, G., Hadfield, G., Hunt, A. H. *St. Bart's Hosp. Rep.* 1939, 72, 181.

perhaps low blood-calcium and phosphorus levels, has not yet been assessed. Further experience will show whether streptomycin or penicillin, or the newer sulphonamides, given in the early stages of acute and generalised jejuno-ileitis, with or without colitis, will remove the need for surgery in the later stages.

## Annotations

### FACTS OF LIFE

A FULL century ago Comte drew attention to the moral consequences of specialisation—for the intellectual as well as the manual worker. He deplored the spectacle of workmen occupied exclusively with making pinheads, and he condemned the intellectuals who spent their lives in resolving equations or classifying insects. One of the results, he said, is "a miserable indifference about the general course of human affairs as long as there are equations to resolve or pins to manufacture."

Specialisation has made giant advances since this warning was uttered. The classifying, tabulating, slot-machine mind, busy with its types and its textbooks, its questionnaires and its opinion polls, flourishes exceedingly today; especially in the fields of economics and medicine. And yet how little we know about life itself with its constant changes, its unexpected turns, its immense variety and richness. To bring us to our senses we need more men like Zweig, a Polish professor of political economy at Cracow University, who set out in 1946 to make a study in London of "secondary poverty"—which is a technical way of describing being poor by spending money wastefully. By intimate and informal conversations with some 400 men in public houses, parks, cafés, dog tracks, football grounds, buses, amusement arcades, railway stations, and many other places where people go for company or to which they drift by circumstance, he has succeeded in giving us a wise and fascinating book about real men and real life.<sup>1</sup> This is, in the main, a story about manual workers; labourers, craftsmen, and other skilled workers earning between £4 10s. and £6 gross a week. We are told why the working man does not believe he can better himself by saving or by any individual effort; why there is little communication between the middle classes, with their eyes fixed on salary scales, promotion, and social ladders, and working men who reach (and know they reach) their economic zenith within a few years of leaving school; why the poor need more pleasure, more passive amusement, than the better off; why the worker, whose individualism is not strongly developed, and who is hardly ever alone, has a much stronger sense of living for the community and by the community than the middle classes; why the income and expenditure of the worker and his family is never stable, but always in an unpredictable state of flux.

On the subject of the health of the manual worker, this Polish observer shows more insight than is apparent in most of the protracted argument about the need or otherwise for a new health service. His book should be read by any who still regard with satisfaction the work of the "panel" during the past 30-odd years. "I was astonished," writes Professor Zweig, "at the number of men who were broken in health, mind and body. . . . It is little realised what health means to the worker. He has only his manual services to offer, and when his health deteriorates he is left with nothing. That is the reason why workers have such a strong feeling of insecurity today. . . . To improve the standard of health of the workers is the greatest contribution any country can make in combating poverty."

1. *Labour, Life and Poverty*. By F. ZWEIF. London: Gollancz. 1948. Pp. 201. 7s. 6d.

### NERVE-FIBRES AND METHYLENE-BLUE

THE staining of nerve-fibres is a difficult operation, as histological techniques go. Most methods turn on the impregnation of nerve-fibres with metallic silver or gold, and the majority, at least of the older methods, even require block impregnation, which is notoriously variable and capricious in its results. The sheer technical difficulty of demonstrating the finest nerve-fibres and sensory and motor endings, particularly in muscle, has been a limiting factor in neurophysiological research. For this reason the publication of a new method of staining nerve-fibres commands special interest and respect.

It has been known since Ehrlich's day that methylene-blue, used as a vital dye, has a strong though not specific affinity for nerve-fibres. Ehrlich himself perfused the living animal with methylene-blue solutions; but work of great value, particularly on the innervation of skin, has been done by staining living tissue slices or shavings *in vitro*<sup>1</sup> or by injecting solutions of methylene-blue locally into the tissue to be mapped for its fibre distribution.<sup>2</sup> Recent reports<sup>3,4</sup> show that the results of using these two methods fall far short of what can be achieved by a technique that reverts in principle to Ehrlich's original method. This new technique, as applied by Feindel, Sinclair, and Weddell<sup>3</sup> in Oxford, amounts in outline to this. Anæsthetised rabbits are perfused through the marginal ear vein with a 0.5% solution of methylene-blue in 0.25% sodium citrate. (A more concentrated solution of dye has lately been adopted<sup>4</sup> to reduce the volume of fluid injected and to lessen the risk of cerebral oedema.) The rabbits survive about two hours' perfusion at the rate of about 0.5 ml. per minute, and a total dosage of 60 ml. dye solution per kg. has been found to give satisfactory results. After death, the tissues are "blued up" by exposure to air—for methylene-blue is reduced to its colourless leucobase in most actively metabolising tissues—and when the colour reaches its peak of intensity fixation in chilled 8% ammonium molybdate solution renders it semipermanent. A recent improvement<sup>4</sup> is to take the tissues through formol-saline after this stage. Tissue so fixed may be cut on the freezing or paraffin microtomes, or may be mounted as thin slices, squashes, or shavings.

Published photographs<sup>3</sup> have already made it clear that this technique is capable of showing up very fine detail in the innervation of most organs; indeed, the authors seem to have been as much embarrassed as overjoyed by the wealth of material it offers. Of special importance, perhaps, is the fact that intravenous methylene-blue will stain degenerating nerve-fibres metachromatically; and a preliminary report<sup>4</sup> suggests that it offers a new and precise technique for mapping the cortex by fibre-degeneration methods.

### POSTURE IN SCHOOL-CHILDREN

So rarely does any report appear in this country on the growth or physique of healthy children that even a somewhat limited investigation deserves general notice. Recently the Research Board for the Correlation of Medical Science and Physical Education sponsored an investigation into the posture of Tottenham school-children. This was carried out by a physical educationist, and is somewhat inappropriately named *Some Aspects of Physique in Boys and Girls*.<sup>5</sup> In all, 892 boys and 960 girls between the ages of two and seventeen

1. Dogiel, J. *Arch. mik. Anat.* 1890, 35, 305. Woollard, H. H. *Brain*, 1935, 58, 352.
2. Weddell, G., Harpman, J. A., Lambley, D. G., Young, L. *J. Anat., Lond.* 1940, 74, 255.
3. Feindel, W. H., Sinclair, D. C., Weddell, G. *Nature, Lond.* 1948, 161, 318; *Brain*, 1948, 70, 495.
4. Feindel, W. H., Allison, A. C. *Science*, 1948, 107, 429.
5. Published from Apothecaries' Hall, Black Friars Lane, Queen Victoria Street, E.C.4.

were examined, and the average heights, weights, sitting heights, and chest measurements at each age are recorded. Besides this, a fairly detailed examination of the feet, hips, and spine was carried out by Mr. R. E. Roper, who reports the incidence of the various defects, which he begins by carefully defining. The most prevalent was flat-foot, which was found in 71% of males and 75% of females, with about the same proportion in each age-group; something under 20% of these defective arches were thought unlikely to respond to treatment. Of the girls 40%, and of the boys 27%, had hallux valgus, usually with an inflamed bursa; the incidence of this defect was higher in the older age-groups, indicating its acquisition and therefore, presumably, preventability. About half the children had overlapping and/or bent toes. Since the proportion who had no defect of the feet was less than a quarter, it is hardly surprising that the report advises education authorities to consider employing chiropodists in schools. Other recommendations include the provision in all schools of large mirrors suitable for studying posture and of special corrective classes for children suffering from minor defects.

### NURSING

NURSING practice has suffered since the vital task of making the patient comfortable has come to be regarded "as a trivial and secondary matter; to be deputed to orderlies and juniors." In commenting on the report of the Working Party on the Recruitment and Training of Nurses, the Medical Women's Federation<sup>1</sup> shows its wish to see pride in English bedside nursing revived. The federation is uneasy about the content of the course proposed by the Working Party, and suggests that the present training, overloaded with theory and expert techniques, does not provide a good model. While it agrees that no woman who has less than three years' training should be accepted for State registration, it fears that if the Working Party's course is applied to all comers many recruits will be lost who have a natural aptitude for straightforward nursing. The federation shares our belief that a good course in bedside nursing could be given in two years, and suggests the title of "hospital nurse" for women who complete such a course.

While agreeing in principle with the Working Party that the student nurse should have student status, the federation doubts whether it will be possible within the next five years to train an adequate number of nurses on the lines suggested in the report. Qualified women should be attracted back to the profession by part-time schemes and by removal of the marriage bar.

### OUT OF ALL WHOOPING

EVERY year the Royal Society of London for Improving Natural Knowledge—to give it its unfamiliar full name—demonstrates some of the growing shoots of the scientific tree to its guests at a conversazione. At this year's gathering, held at Burlington House on May 20, the advances in microscopy were perhaps most striking to the medical eye. The new phase-contrast technique makes it possible for the first time to see clearly the chromosomes in living cells, and a film produced at the Strangeways Laboratory showed in startling detail the process of mitosis in embryonic osteoblasts and fibroblasts in tissue cultures. Ultraviolet microscopy, which gives about double the resolution of ordinary light, cannot be used for direct observation of living cells, but micrographs made by this technique are of great value in studying the structure of nuclei. Kodak Ltd. have devised a series of photographic emulsions of different sensitivity for recording the tracks of the different particles emitted from the atomic nucleus. In auto-

radiography of the thyroid, after the administration of radioactive iodine, a sensitised emulsion is floated on to the surface of a cut section. An exhibit which would appeal to pin-table enthusiasts was shown by the Cavendish Laboratory: the energy emitted by alpha particles, after amplification, drives a small "billiards cue" against steel balls, and the "score" registered by each ball is a measure of the speed of the particles.

Then there was a full-scale model of the B.T.H. betatron installed at the Clarendon Laboratory in Oxford; a beautiful model of a 90-gun ship of 1706; some brass plates on which coats of arms had been cut in relief by high explosive; an apparatus for recording radio-frequency radiations from the sun and stars; new sorts of glass which will transmit the ultraviolet radiations needed for sterilising the air but will check the shorter waves which decompose oxygen; an ultrasonic memory system for an electronic calculating machine; one of Hertz's original manuscripts on electromagnetic waves; and specimens of the Australian barnacle which is invading British estuaries and threatening our shellfish. Last but not least there was a delightful aquarium as used at the Wellcome Research Institution for the culture of *Planorbis boissyi* and *Bulinus truncatus*, the snails which carry schistosomiasis. By an ingenious adjustment of the flora and fauna the snails can enjoy their meals of boiled lettuce in a clear and odourless environment.

### TESTS OF PATERNITY

IN 1939 Lord Merthyr's Bastardy (Blood Tests) Bill sought to enable our courts to require tests of the blood of the mother, the child, and the alleged father, this evidence being at present obtainable only by consent. Lord Merthyr then told the House of Lords that, if the results of blood tests were made available, an incorrectly accused man could be definitely exonerated in from 10 to 15 cases out of 100. The odds continue to improve. Mr. Sidney Schatkin, whose *Disputed Paternity Proceedings*<sup>1</sup> has just appeared in a second edition, observes that in 1943 the proportion was 1 in 3 and that now it is rather better than an even chance. This improvement is a result of the discovery of the Rh factor, announced by Landsteiner and Wiener in 1940. "The development of Rh has raised to 360 the total number of blood-type combinations that can be separately distinguished."

When his book was first produced four years ago, Mr. Schatkin hoped it might persuade the 41 State legislatures of the Union which had so far not enacted blood-test statutes to make good their omission. Here, for a precedent, is the relevant subsection of the New York City Criminal Courts Act:

"The court, on motion of the defendant, shall order the mother, her child and the defendant to submit to one or more blood-grouping tests by a duly qualified physician, to determine whether or not the defendant can be excluded as being the father of the child, and the results of such tests may be received in evidence but only in cases where definite exclusion is established."

The Merthyr Bill was somewhat similar:

"The court may, and at the request of either party shall, order a test of the blood of the mother, the child and the alleged father."

The Bill was remitted to a Select Committee which heard interesting evidence. The Home Office view was that, if tests could be carried out in conditions which excluded all doubt of the validity of the results, too much weight should not be attached to the mother's objection. A stipendiary magistrate suggested that, as these were civil proceedings, a mandatory order from a court would be an interference with the liberty of the subject. Mr. Claud Mullins contributed the drastic proposal that intercourse with the mother at the material time should render a man liable to pay for the maintenance of the

1. Memorandum submitted to the Minister of Health by the Medical Women's Federation, 73, Bourne Way, Hayes, Bromley, Kent.

child, whether he was proved to be the father or not. The Select Committee's report, issued in April, 1939, favoured the principle of the Bill, though recognising exceptional conditions (such as hæmophilia) in which the tests might be detrimental to health. Little more was heard of the Bill. Private members have not been allowed to introduce any legislative proposals, and this is not a subject which the Government is likely to take up.

In the United States novelty of method is no obstacle. Mr. Schatkin cites several cases where scientific findings which exonerated the alleged father have been followed by the mother's confession that her allegation was false. Sometimes, we learn, the result has been further checked by recourse to the "pathometer" or "lie detector." In England forensic practice is less adventurous; but the risks of perjury and blackmail are disquieting, as the case of *R. v. Batchelor* showed in 1934. A man went to prison 19 times in three years because he refused to obey an order to pay for maintaining a child of which he insisted that he was not the father. At length he was vindicated, the mother being convicted of perjury at Kent assizes. Blood tests might not have excluded him; but if there is now rather more than an even chance that such a man when wrongfully accused can be exonerated, why do we hesitate to give our courts the power to obtain what may be unchallengeable evidence in his favour?

#### YOUNG LAWBREAKERS

In Liverpool, as in so many places, juvenile delinquency has been increasing since about 1930. An inquiry<sup>1</sup> by the department of social science of Liverpool University shows that indictable offences reached peaks in 1940 and 1942 but have declined a little since. The writers quote J. H. Bagot's opinion that the great changes in legislation in 1908 and 1933, by stimulating public interest, led to an apparent rise: cases now come before the courts which were formerly dealt with on the spot by the offended party. But they draw attention to other possible factors. Delinquency increased at the time of the 1908 depression, and during the 1914-18 war; it fell during the period of post-war prosperity, but rose with the unemployment and unrest which culminated in the General Strike of 1926. An improvement during the boom period was followed in 1929 by a rapid increase in juvenile delinquency as unemployment again grew; and there was some decrease during rearmament, when unemployment also fell. The war-time increase could have been predicted and perhaps prevented. Some reciprocal findings are also suggestive: thus when many children are convicted few are cautioned, and when many are cautioned fewer are convicted; and the same balance appears between indictable and non-indictable offences. Something, then, must depend on police practice at the time.

During the late war indictable offences did not become much more numerous in Liverpool, for many children were away in the reception areas; but the incidence of convictions for such offences among children aged 8-16 rose from 1.3% in 1938 to 1.9% in 1945. Offenders were mostly boys, and a rise in the proportion of the offenders aged 14-16 suggests that adolescent difficulties were partly responsible and need special study. Small gangs, usually of four or five children, are often formed, and act as training and organising centres for delinquency; but the fact that children form such gangs is evidence of their need for organised group activities at this time of life. Over 40% of delinquents have a history of previous conviction for indictable offences.

The writers of the report set against these urgent and depressing figures what we know of the psychology of children, and make constructive suggestions. They

propose that a committee should be formed, representing all the statutory and voluntary organisations that have an interest in the child and the adolescent, to consider a policy for their welfare. This policy should aim mainly at the development of existing services. Instruction of the parents comes first in the list—instruction not merely in managing the child's physical development but also in understanding his emotional development from the earliest years. The educational task should fall on the antenatal clinics, the maternity and child-welfare services, and the health visitors. The special group of "problem parents" will need not only advice and exhortation but help and supervision. Nursery schools and nursery classes could relieve mothers, help in the child's training, and give the parents continuous advice and guidance. The play needs of pre-school children should be catered for in parks and open places; the space reserved for them need not be large, but they must have play materials, such as sand and water. Children of school age should be given opportunities for leisure activities, especially in parks and playgrounds. Junior youth clubs, the report states, have hardly been tried as yet in Liverpool; and it is odd that no mention is made of Scouts and Guides. In changing from school to a job, adolescents need more help than they now get, though the juvenile employment committee is beginning to do good work. It is even more important, perhaps, to have enough good clubs, open every evening, especially at the weekend. Sunday is the worst day for indictable offences.

#### MERCURY AND PINK DISEASE

In a recent annotation<sup>1</sup> we quoted a statement<sup>2</sup> that Warkany and Hubbard had found mercury in the urine of children with pink disease (infantile acrodynia, Feer's disease); on page 829 Professor Warkany and Professor Hubbard set out their observations in detail. They do not claim that pink disease is simply mercurial poisoning, but they show that in 10 of 20 children with the disease the metal was found in the urine in much higher concentrations than were encountered, even occasionally, in controls. Mercury was absent from the urine of only 2 of the 20 patients, and these were older children aged eight and fourteen years. The condition is much commoner in England than in the United States, but examples of it at such advanced ages are hardly ever encountered here. Mercury in low but appreciable concentrations was found in the urine of one child who had taken calomel but was not suffering from acrodynia, and Warkany and Hubbard suggest that the children who develop acrodynia have an idiosyncrasy to mercury—a possibility which has also been entertained by Fanconi et al.<sup>3</sup> in their account of hypersensitive reactions to mercury therapy in childhood. The Swiss writers think of pink disease as a late neuro-allergic reaction to mercurial or other toxins. Warkany and Hubbard instance the resemblance between one variety of arsenical poisoning and pink disease, but Fanconi et al. think that infective agents are the main sources of toxin.

Thousands of London children are given mercurial "teething powders." *Autres pays, autres mœurs*: the tots of Zurich swallow "worm cures" of calomel and santonin. But both Warkany and Hubbard and Fanconi and his collaborators warn us also of the occasional dangers of mercury ointments, which (like grey powders) are widely prescribed here too; let us remember this before we put all the blame on the home remedies of hard-pressed mothers.

THE British Medical Association has accepted the invitation of the Medical Association of South Africa to hold its annual meeting in Johannesburg in 1950 or 1951.

1. Apr 1. 24, p. 644.

2. Bivings, L., Lewis, G. jun. *J. Pediat.* 1948, 32, 63.

3. Fanconi G., Botszstein, A., Schenker, P. *Helv. paediat. Acta.* 1947, 2, suppl. 4.

1. *Youthful Lawbreakers.* Liverpool: University Press for the Liverpool Council of Social Service. 1948. Pp. 47. 2s. 6d.



## Special Articles

## THE MEDICAL CURRICULUM

## B.M.A. COMMITTEE'S REPORT

WITH Prof. HENRY COHEN as chairman, a committee was formed by the British Medical Association in 1945 "to review the association's report on Medical Education (1934) in the light of later developments and the requirements of modern practice." The following is a summary of the committee's principal recommendations.<sup>1</sup>

*Aim of the Medical Curriculum.*—The student must be trained in both the science and the art of medicine, in which the scientific outlook and the humane are complementary. The aim of medical education is to equip him with sound basic principles, including the scientific outlook and method; a knowledge of the art of medicine and the fundamentals of the medical sciences; competence in, and understanding of, certain indispensable techniques; and an intellectual resourcefulness and initiative in the handling of unusual and unexpected situations.

*Selection of Students.*—Those who control the choice of medical students are under an obligation (1) to secure that those students who possess a natural ability for medicine are guided to this field, and (2) to ensure that the community receives the greatest benefit possible for the money it expends. Responsibility for selection should be in the hands of a small committee of members of the medical-school staff, and there is room for experiment in methods. After the first, and again after the second, year of study there should be a ruthless weeding out of students found unsuitable.

## PREMEDICAL EDUCATION

*Pre-university Education.*—In the pre-university studies of the prospective doctor there should be no vocational bias. General cultural subjects should be continued until he enters the university. He should spend his first year there in the further study of the sciences on which medicine is based—namely, physics, chemistry, and biology—and in developing the scientific attitude.

The committee agrees with the Goodenough Committee that the present form of Higher School Certificate should be abolished and that general science should be taught in the schools to intending medical students as a non-vocational subject, but it disagrees with the recommendation that a school-leaving examination, taken at 18 years or older, might be accepted as fitting the student for admission to the "medical curriculum proper." It also disagrees with the Goodenough Committee's suggestion that the student coming from school with a "good elementary grounding" in general science will need to spend relatively little time on physics, chemistry, and biology in his medical course, and that such special training as is necessary can be given as part of, or in association with, the teaching in anatomy and physiology. "This may serve as a means of shortening the medical course as a whole, but . . . it is ill-advised and denotes a failure to recognise the fundamental importance in medical education of a thorough training in the methodology of science which can be best inculcated in a special course in science at a university standard and in a university atmosphere."

Scholarships offered to medical students should be awarded on the basis of general cultural education instead of on a premature specialised knowledge of a few subjects; and no medical student should be exempt from the first-year university course in the basic sciences.

*First-year Curriculum.*—This course should be organised so as to provide for an integrated or synoptic teaching of the basic sciences, and there should be close co-operation among the teachers of the three sciences and a co-ordination of the syllabuses. Instruction in physics

and chemistry should take regard of modern atomic concepts, and a single course in general biology should be substituted for the usual separate courses in botany and zoology. In this less emphasis should be placed on detailed classification and dissection, and more on such biological principles as evolution.

The first-year course should include some instruction in the elements of statistics and statistical methods in medicine, and from his first year the student should be encouraged to make intelligent use of libraries.

## PRECLINICAL PERIOD

In the teaching of preclinical subjects there must be constant correlation of structure with function. The student should be provided with a synoptic view of the whole field of the structure, functions, and processes of the human organism. Such correlation requires personal contact and good will among the teachers, and the integration of the syllabuses.

*Anatomy.*—The instruction should be planned to give the student a sound general knowledge of the structure of the human body based on the biological principles which form the background of such knowledge, due attention being given to the functional aspects. Integration of the teaching of anatomy and physiology is urgently needed. The order in which anatomical and physiological knowledge is presented to the student frequently determines the security of his grasp of it. It is desirable that, as a rule, he should be taught first the general structure of an organ or system, and then its function, and finally he should undertake the detailed anatomical dissection.

Dissection of the entire body is essential, but the amount of topographical detail taught should be considerably reduced. The anatomy of the nervous system should be better taught than in the past, and the instruction in anatomy should include the postnatal growth of the body. Only the basic principles of embryology should be taught at this stage.

Reorientation of the teaching of anatomy will require experiment and the replacement of existing manuals by new textbooks. The difficulty arising from the confusion of anatomical nomenclature would be diminished if clinicians would agree to acquaint themselves with, and use, the Birmingham nomenclature.

*Physiology and Biochemistry.*—These should be correlated to form a single unified course.

The reforms most urgently needed in the physiology course are (1) its correlation with anatomy and the premedical and clinical subjects, and (2) the reorientation of the syllabus so that greater emphasis is laid on human physiology and less on animal experimentation.

The organic chemistry included should be only such as will help the student to understand the biochemical processes of health and disease and the general concepts which underlie them. The practical course in biochemistry should be designed to demonstrate, on the qualitative side, certain physicochemical phenomena, while qualitative experiments should be confined to the least complicated techniques and those which illustrate principles.

There should be facilities for teaching histology in both the anatomy department and the physiology department, but the teaching of large classes should be conducted in only one of them.

Clinical applied physiology should be taught, in the later part of the course in physiology, by a physiologically trained physician attached to the department of physiology. Clinical teachers should emphasise the disturbances in structure and function which result in disease.

*Normal Psychology.*—The syllabus should be closely linked with the first-year teaching of biology and with the other preclinical subjects. The purpose of the study is (1) to convince the student of the essential place of mental processes in his general study of the normal

1. *The Training of a Doctor: report of the medical curriculum committee of the B.M.A. London: Butterworth. 1948. Pp. 151. 7s. 6d.*

structure and function of man; (2) to equip him with standards of reference against which he may assess deviations from normal; and (3) to provide him with a basis for the rational appreciation of the doctor-patient relationship. More attention should be paid to the relevance of knowledge in psychology to social relationships.

*Time-table.*—The preclinical period should occupy four terms of 12 weeks and a month of the summer vacation.

#### CLINICAL PERIOD

*The Integration of Medicine.*—The clinical training at present given is misdirected in aim, structure, and balance. Its general purpose should be to teach the student the general principles of medicine, to train him to a sufficient degree of skill to diagnose and treat common ailments in minor medicine and surgery, to recognise conditions for which he should summon more expert help, and so to orientate his attitude to medicine that he sees his patient as a whole.

The object of undergraduate teaching is not to train good general practitioners but to provide a foundation for any branch of practice. The committee rejects the proposal that general practitioners should participate in undergraduate teaching to counteract the present specialist or consultant bias of medical education. Balance should be restored by an entire reorganisation, one of the primary reforms being the return of the physician with a general outlook. There should be more whole-time teaching appointments, and the conditions of part-time teaching should be sufficiently attractive to prevent its being subordinated to the calls of practice.

The hospital work of an undergraduate medical school should be organised primarily to promote the integrated teaching of medicine. To this end, the committee suggests that there should be general admission wards; the arrangement of the wards should be based on the treatment of the patient as a "whole"; there should be a minor-ailments clinic; and provision should be made for all types of cases required for medical training.

*Methods of Teaching.*—More teachers with a high degree of teaching ability are required. Senior teachers should undertake a large proportion of the earlier teaching.

Too often ability to teach is not regarded by appointing bodies as a primary qualification in a teacher of medicine, with the result that the student does not derive full benefit from his training and the status of medicine suffers. One teacher laments: "How rarely are lecturers, honoraries and in particular, professors, chosen because they can teach. One of the greatest of the various shortcomings of the Goodenough report was its constant use of the *cliché* 'teaching and research' as though they were synonymous. Usually they are antonyms. . . ." The committee recommends that, if a professor or person in charge of a clinical subject is primarily interested in research, another person should be made responsible for the actual teaching.

The greatest emphasis should be placed on diagnosis and all that it implies. The student should be taught to synthesise his knowledge as he acquires it, and should be made to see the importance of his preclinical studies. Systematic lectures serve a useful purpose but need more forethought than they are often given. Discussion classes and lecture-demonstrations should supplement routine lectures, and joint teaching by means of case-conferences is invaluable to the student at the later stage of his clinical studies. In ward classes the student should take an active not a passive part.

Inpatient clerkships should be so organised as to encourage the student's sense of responsibility for his patients. He should be assigned an adequate variety of cases, but it is not necessary for him to be appointed to inpatient clerkships in the specialties.

The main purposes of outpatient teaching are (1) to enable the student to observe how an experienced

physician or surgeon approaches and treats a patient who is a stranger to him; (2) to provide for the student exercises in his clinical skill; and (3) to demonstrate the importance of following up patients.

The syllabus should allow the student leisure, both for relaxation and for reflection.

#### CLINICAL CURRICULUM

*Introduction to Clinical Medicine.*—The purpose of the introductory course (which should occupy six months) is wrongly conceived in many schools. It should be to lead the student from his study of the normal man to the study of deviations from the normal and to the general principles underlying the practice of medicine. It should include simple demonstrations of general principles, an introduction to the use of accessory aids to diagnosis, and preliminary instruction in the methods of taking and recording histories. He should be brought into contact with patients, but should not be assigned to individual patients as clinical clerk. References to treatment should not, at this stage, be stressed.

At the end of this course the student should be required to pass a professional examination in general pathology.

*Pathology and Bacteriology.*—The teaching, including the systematic lectures, should be spread over the whole of the clinical years, and the pathologist and clinical teachers should cooperate. The living patient, not the corpse, should be the central theme, and the pathology of abnormal mental states should be included. Clinico-pathological conferences should be a feature of the teaching of pathology, and clinicians should take an important part in the teaching on biopsy and post-mortem material.

The course should be free from the specialist bias illustrated by the excessive detail of many present-day courses, the amount of time devoted to the teaching of techniques, the attempt to cover the whole field of special pathology, and the over-emphasis on clinico-pathological investigations in diagnosis. The student, however, should carry out simple clinico-pathological investigations during his clerkships.

*Materia Medica, Pharmacology, and Therapeutics.*—The professor of pharmacology should be given a definite status in ward teaching and should be in charge of a certain number of beds. Experimental pharmacology should be confined to simple experiments which have a real and practical educational value.

*General Medicine.*—The instruction should include lectures, clerkships, outpatient attendances, and casualty work, throughout the clinical years. There should be two periods of medical clerking of three months each, outpatient teaching being concentrated in the second period. The student should reside for one month in the casualty department.

Some of all types of illness should be assembled for teaching purposes, and clinical conferences should be an important feature of the teaching. Tuberculosis should be taught as an aspect of general medicine and not as a special disease.

Emphasis should be placed on prevention, and more attention should be paid to chronic diseases and disease in the aged.

*Surgery and Anaesthesia.*—The aim of the course in surgery should be to teach the principles of surgical diagnosis; early recognition of surgical conditions, especially emergencies, in which operation might save life; the elements of first-aid; the treatment of such minor injuries and conditions as a general practitioner might be called upon to give; the surgery of sepsis; and the scope of operative surgery—without the technical details of operations. It should include two dressing appointments of three months each, systematic lectures, and work in the outpatient and casualty departments. The student should attend operations on his own patients but not on other cases.

For the purpose of undergraduate instruction orthopaedic surgery should not be divorced from general surgery. The student is likely to derive more benefit from following fractures, or other orthopaedic conditions continuously from admission to discharge than from the demonstration of a number of cases at each stage of progress.

The student should see something of the scope, achievements, and methods of special branches of surgery. He should be instructed in the scope and principles involved in anaesthesia and taught to administer simple anaesthetics for minor operations.

The committee criticises two practices in connexion with final surgical examinations—namely, the submission of difficult or obscure pathological specimens for identification, and the exhibition of obsolete instruments.

**Obstetrics and Gynaecology.**—The training should enable the practitioner to fulfil the requirements of the Medical Acts without taking special postgraduate diplomas. Obstetrics is more important to the student than gynaecology, and he should aim at delivering at least 20 normal cases.

The course, which should take place after the medical clerking and surgical dressing appointments, should consist in systematic lectures, a clerkship in obstetrics for two months, and a clerkship in gynaecology for one month. The teaching should be linked with that in related subjects, especially paediatrics.

**Paediatrics.**—A sound and adequate training in paediatrics is essential to the practitioner, whatever branch of medicine he intends to practise. It should emphasise prevention.

Paediatrics should be studied after obstetrics and gynaecology, and the instruction should include a paediatric clerkship and systematic lectures. In the professional examination the paper in medicine should contain questions on child health, and children should be included in the clinical examination.

**Psychiatry.**—The study of psychiatry should pervade the whole of the clinical period, and general physicians should interest themselves more in the psychiatric aspects of illness.

The teacher should have regard to the student's own mental development and his difficulties in approaching psychiatry. Instruction should be practical and clinical rather than theoretical, and should include outpatient work and case-taking. Attendance at the children's sessions of the psychiatric department, and extramural visits, should be included.

It is undesirable to set a special professional examination in psychiatry.

**Social Medicine, Industrial Medicine, and Public Health.**—The whole subject of public health as at present taught to the medical student needs to be completely recast. The instruction should take two forms: (1) the inculcation by all teachers of the place, importance, and significance of social medicine; and (2) systematic teaching distributed throughout the clinical period. All clinical teachers must develop a preventive outlook.

The existing public-health courses should contain less technical detail than is now usual. The student should see various public-health services and clinics in action. Industrial medicine should be taught as a special aspect of social medicine and should be regarded as the industrial factor in medicine. There should be no separate professional examination in social medicine.

**Forensic Medicine.**—Teaching should approach more closely the needs of the ordinary practitioner and take less account of details which are properly the sphere of the expert. Toxicology should be taught from a clinical point of view, but it is not necessary for the toxicologist to have charge of beds.

The course should be taken in the summer preceding the final year, and should include clinical work,

systematic lectures, practical demonstrations, and visits to courts.

**Ophthalmology.**—The student should be taught (1) to determine the anatomical site of the lesion; (2) to classify it pathologically—i.e., according to whether it is developmental, traumatic, inflammatory, neoplastic, or degenerative; and (3) to decide whether the case should be referred to a specialist. Outpatient training should be confined to demonstrating how refraction work is done and the routine procedures and simple treatment given by the sister-in-charge. Eye conditions which are manifestations of disease in other parts of the body come within the sphere of the general physician.

**Diseases of Ear, Nose, and Throat.**—The clinical work should be undertaken in the outpatient department, which is also likely to provide the most suitable material for the purpose of demonstrations and tutorials.

**Dermatology and Venereal Diseases.**—The aim should be to train the student in the basic principles of dermatology, and the teaching should be interwoven with that of general medicine. In the professional examination the test of the student's knowledge of skin conditions should be incorporated in the examination in general medicine.

Instruction in venereal diseases should be given concurrently with the special teaching of dermatology. Its scope should be restricted to the commoner manifestations.

**Physical Medicine.**—The purpose of the course should be to enable the student to understand the nature, scope, and purpose of the methods of physical medicine, to become acquainted with the instruments and technical procedures employed, to be conversant with their physiological effects and contra-indications, to know how to prescribe them, and to be familiar with some of the commoner conditions for which physical medicine may be beneficial.

**Radiology.**—Radiology should form an integral part of the curriculum and not be confined to a special course. The student should be taught its scope and methods, but not its special techniques.

**Time-table.**—The committee recommends that:

- (i) A minimum of 8 weeks' holiday should be provided for during each clinical year.
- (ii) The year should consist of three terms of 13 weeks each, all lectures and appointments being fitted into the terms.
- (iii) All members of a class or firm should begin at the same time and should be at the same stage of dressing or clerking.
- (iv) One clear term before the final examination should be left free to the student for personal revision.

#### PROFESSIONAL EXAMINATIONS

Well-designed and well-conducted examinations are an essential part of the machinery of education. But the committee thinks that the type of examination now set is not the most efficient test of a student's knowledge and capacity for understanding. There are also too many separate examinations with but little relationship between them, and they occur too frequently during the clinical years.

Professional examinations should be conducted essentially by the combined internal-external method, but the attitude of medical schools to the final examination needs reorientation.

The final examination should be devised as a whole, without separate papers in the specialties. It should be designed to test not only the candidate's knowledge of facts but also his grasp of general principles, his appreciation of the aims of medicine, his approach to the patient, his capacity to correlate his findings, and his ability to apply diagnostic methods to the recognition of common disease states.

There should be no professional examination between the examination in general pathology at the end of the

transition course and the completion of the full curriculum, a period of 2½ years. The student should then take the whole of the final examination at one time. The internal examiners in all subjects should form themselves into a committee to undertake the responsibility for the general organisation of the examination.

The clinical examination should take place in a hospital rather than in an examination hall, and its main purpose should be to test the candidate's power of observation and his ability to correlate and assess his findings in arriving at a diagnosis.

Examiners should serve some kind of apprenticeship before they assume full responsibility. The examiner should accept views which he may not share, if they are part of current teaching.

#### THE INTERN YEAR

While the committee strongly endorses the proposal for compulsory pre-registration resident appointments, it does not regard the usual methods of intern appointments as being best suited to the aims of internship. The purpose of the intern year should be to consolidate the basic training given, and the appointments should therefore be based on the same conception of medicine as the curriculum. The year should be largely devoted to an integrated study of patients and not be divided into "medical" and "surgical" appointments. The student should be assigned patients, as sick persons, as they are admitted to the hospital. A suitable ratio would be one intern to every 20 or 25 beds.

A "warden" should be responsible for the educational programme and welfare of the interns, and they should be paid an adequate salary. Non-teaching hospitals used for intern purposes should be approved by the medical school.

There should be no examination at the end of the intern year. For the purpose of admission to the Medical Register the approved hospital should certify through the qualifying body that the student has satisfactorily completed his appointment.

#### DISCUSSION AND EXPERIMENT

Because of the manifold problems of medical education, and the absence of any suitable machinery for their discussion and investigation, the committee recommends the formation of an Association of Teachers in Medical Schools.

### WASHINGTON CONGRESS OF TROPICAL MEDICINE

THE Fourth International Congress of Tropical Medicine and Malaria, which met in Washington from May 10 to 18 under the presidency of Dr. L. A. Scheele, director of the U.S. Public Health Service, was opened by Mr. George C. Marshall, Secretary of State, and attended by nearly 1300 members from 42 countries, Russia being a notable absentee. The subjects for discussion were divided into twelve sections.

In *Section I* the vast problems of research and teaching in tropical medicine were discussed by Dr. A. F. Mahaffy of London, Dr. M. C. Balfour of Shanghai, Dr. A. H. Baldwin of Sydney, Prof. M. H. Soule of Ann Arbor, Michigan, and Dr. O. R. McCoy of New York. All agreed on the need for training more research-workers in tropical medicine and improving and increasing the facilities for teaching the subject.

In *Section II* there was only a single short discussion on tropical climatology and physiology.

In *Section III*, whose subject was bacterial and spirochætal diseases, there were sessions on tuberculosis; syphilis, yaws, pinta, and relapsing fever; plague; enteric diseases and cholera; electron microscopy; leptospiroses; and leprosy. Dr. A. Frappier of Montreal dealt with the factors influencing the potency and

toxicity of B.C.G. vaccine. Dr. Hiller of the U.S. Public Health Service and Dr. G. Varela of Mexico discussed the great benefits and optimistic future of the penicillin treatment of syphilis and yaws. In the session on plague the general opinion was that by proper use of the new insecticides, rodenticides, and baiting techniques it should be possible to control the spread of the disease. Opinions differed on the respective merits of living avirulent and dead plague bacilli vaccines. An effective vaccine suitable for use in all the varied climates and conditions where plague is endemic has yet to be developed.

*Section IV*, on virus and rickettsial diseases, saw probably the most important communication of the entire congress—the first interim report on the treatment of scrub typhus with chloromycetin. Dr. J. E. Smadel of Washington, who had done the chemotherapeutic tests against the viruses and rickettsia in the laboratory,<sup>1</sup> is coöperating with Dr. Raymond Lewthwaite at Kuala Lumpur in Malaya in clinical trials. In a series of 25 cases, treated with chloromycetin by mouth for only three days, there were no deaths and no complications and the average stay in hospital was only half that of 12 control untreated cases occurring in the same area; and one of the untreated patients died. These are the most promising results ever achieved in human rickettsial infections and convey great hope for the future.

Dr. F. O. MacCallum of London and Dr. W. P. Havens and Dr. J. R. Neefe of Philadelphia reviewed the present position of virus hepatitis and agreed that there are probably at least two viruses responsible for the disease. They emphasised the importance of recognising the possibility of transmitting hepatitis by blood-transfusion, and by venipuncture and injection with inadequately sterilised syringes and needles.

Prof. A. B. Sabin of Cincinnati described the isolation of two strains of sandfly-fever virus in the Mediterranean regions by inoculation of human volunteers. The disease could not be transmitted to animals or chick embryos. He also described the isolation of a number of immunological different strains of dengue virus in mouse brain. Further studies are being carried out to obtain information on the old question of the relation, if any, between dengue and yellow fever.

In the discussion on poliomyelitis, several speakers remarked on the much higher rate of paralytic poliomyelitis in Europeans than in the local populations in tropical regions. Dr. J. H. S. Gear described the isolation of virus from the faeces of children in native villages where there was no evidence of the disease and the nearest recognised case was twenty miles away. He found no antibodies to the Lansing virus in a large number of wild-caught monkeys in South Africa. There was an interesting discussion on the age-distribution, the inaccuracy and variation of reporting of cases, and the significance of the presence of neutralising antibodies for the Lansing strain of poliomyelitis.

In his description of neurotropic viruses in Central Africa, Dr. K. C. Smithburn of Entebbe pointed out that in the past ten years 8 distinct new viruses have been isolated in East Africa. Well may it be said that "the woods are full of them" and there is an obvious need for more attention to the study of these problems by the Colonial Medical Research Council. In a paper on the epidemiology of rabies Dr. H. N. Johnson outlined the problem of eradicating the disease in wild animals. Several speakers dealt with this problem and with the improvement and standardisation of vaccines.

*Section V*, on malaria, met under the chairmanship of Major-General Sir Gordon Covell. Sessions were held on parasite host relationship, entomology, chemotherapy, immunity, control and the present proportions of the global malaria problems. Prof. H. E. Shortt described his recent work on the pre- and exo-erythrocytic stages of *P. cynomolgi*.<sup>2</sup> The general impression gained from the discussions on anopheline control and chemotherapy was that malariologists are optimistic concerning the future control of the disease.

In *Section VI*, on helminthic diseases, it appeared that the progress of chemotherapy against filariasis and schistosomiasis has been very slow but arsenamide,

1. See Annotation, *Lancet*, 1947, II, 952.

2. See leading article, *Lancet*, Jan. 31, p. 182.

'Hetrazan,' and 'Neostibosan' were said to have some effect in filariasis. A cheap water-soluble molluscicide, potent, but non-toxic to higher animals and crops, is badly needed.

Section VII, on protozoal diseases, included sessions on amebiasis, and on the blood and tissue flagellates. Reviews of the present position of our knowledge in these infections in different countries were given and Dr. C. A. Hoare of London proposed a revised classification for the mammalian trypanosomes.

Section VIII, on nutritional diseases in the tropics, considered the vast problems of the deficiency diseases of India, China, and South-east Asia and the American tropics. Drs. T. and J. Gillman of Johannesburg urged the need for experimental work on the supplementation of natural diets before we can suggest substitutes for good food or tamper in other artificial ways with national feeding programmes.

Section IX, on tropical dermatology and mycology, dealt with epidemiological and cultural studies of coccidiomycosis and haplomyces, South American blastomycosis and histoplasmosis, and modern trends in the treatment of granuloma venereum.

Section X dealt with tropical veterinary medicine.

Section XI, on public health, considered the general problems concerned with the training of personnel for this field in the tropics and the present position with regard to tuberculosis in India, Jamaica, and South Africa.

In Section XII, on medical entomology, many of the discussions were linked with problems in other fields, and the use of D.D.T. and other insecticides in the control of mosquitoes was discussed in one session, the control of sandflies and tsetse flies in a second, and ticks, mites, lice, and fleas in a third.

On two evenings stirring memorial sessions were held commemorating the establishment by Walter Reed of the mosquito transmission of yellow fever, and the 50th anniversary of the discovery by Ross of the method of transmission of malaria. Some of the survivors of Reed's experiments were present in the audience. Sir Malcolm Watson gave the address of the evening for the Ross commemoration.

There was an interesting boat trip to Washington's home at Mount Vernon and the congress closed with a dinner on May 18. Dr. C. Hackett's fine opening address ensured the success of the evening. Amid terrific applause Professor Shortt received the Laveran medal for his recent work on the exo-erythrocytic stage of *P. cynomolgi* and Prof. N. H. Swellengrebel, of Holland, received the Walter Reed medal for his many contributions to tropical medicine.

## GENERAL MEDICAL COUNCIL

### APPLICATIONS FOR REGISTRATION

OPENING the 173rd session of the council on May 25, Sir HERBERT EASON, the president, reported that the seventh *British Pharmacopœia*, 1948, would be published with effect from Sept. 1, and advance copies had been circulated for inspection.

Describing the work now being done by the executive committee under the Medical Practitioners and Pharmacists Act, he recalled that its primary purpose is to settle the position of practitioners temporarily registered by virtue of Defence Regulation 32B or of the Polish Resettlement Act, 1947. The number so registered is, he said, 4561, of whom about 4200 are registered under the Defence Regulation; but registration under the new Act was permissible only to persons resident in the United Kingdom. "Very few, therefore, of our colleagues who came to our help in our extremity from the Provinces of Canada with which, unfortunately, we have no reciprocal relations under the Medical Act, 1886, and from the United States of America, will wish or be able to remain on the register at the price of fulfilling this condition." It followed that section 2 of the Act, which provides for the registration, without limit of time, of practitioners already registered temporarily, would apply almost exclusively to practitioners qualified on the Continent who found refuge in this country and had

augmented the strength of the profession. Of these between 900 and 1000 had applied for registration under the new Act. Those whose qualifications had already been recognised by the council, before they were temporarily registered for service in hospitals or as assistants, had to fulfil only one condition beyond that of residence—namely, they must satisfy the council that they rendered satisfactory service while temporarily registered. Those who were temporarily registered only for service with Armed Forces must in addition satisfy the council that they hold qualifications which sufficiently guarantee professional competence.

"The council will not be surprised to hear that the executive committee consider registration in the Medical Register without limit of time a valuable privilege. The Act, by providing an appeal to the Privy Council against a refusal by the council to register, secures that this privilege will not be capriciously withheld from an applicant. The requirement that an applicant under section 2 must fulfil the condition that his previous service has been satisfactory seems to the committee to show no less plainly that this privilege is not to be conferred after any perfunctory examination of an applicant's record of service, but only after satisfactory answers have been received to references made on behalf of the committee to the hospitals or other institutions or services, or to the practices, in which he has worked, or to the authorities of any Armed Forces in which he has served; to the Central Medical War Committee as the advisers of the Government on the maintenance of an adequate medical service for civilians during the war; to the Ministry of Health; and to the Home Office as the department concerned with aliens.

"References on this scale make much work and must take time to complete. While some practitioners temporarily registered early in the war have been continuously employed in one or two posts ever since, it is not uncommon for others to have served in twenty or thirty hospitals, &c., or practices; and at least one applicant has been in as many as sixty posts. I find that at least 1500 letters have been sent on behalf of the council to bodies and persons concerned for evidence of satisfactory service. . . . Extracts reproduced by microfilm process from about 750 applications have been sent to the Central Medical War Committee and the civil departments concerned; and reference has been made to the appropriate Service department in nearly 200 cases in which the practitioner has served in Armed Forces."

The verification of details of service mainly given under war conditions was a laborious process, and particular applicants might feel that it takes much too long to get registered.

"Since the number of applicants under section 2 so far registered is today, more than five months after the passing of the Act, only between 100 and 200, I am not myself disposed to argue that the position could not be more satisfactory. But I hope that by explaining . . . the precautions which the executive committee think it their duty to take before directions for registration under the section are given, I have made it clear that such a direction cannot properly be given in any case until the committee have evidence of satisfactory service which has to be obtained by them from other persons and bodies.

"Practitioners temporarily registered by virtue of the Polish Resettlement Act, 1947, have also been required by Parliament under section 2 to fulfil the condition that their professional service whilst so registered has been satisfactory. Since that Act was not passed until March, 1947, the period of service in question is short, and the executive committee hope to be able to deal quite expeditiously with the applications in this category, of which there cannot be more than about 300."

The Act also included provisions in favour of practitioners not on the Temporary Register. About 60 applications had been received under section 3 and about 40 under section 4. Section 3 referred to practitioners who had served in H.M. Forces outside the United Kingdom, and the committee recognised "a special obligation to deal with these applications as soon as evidence of satisfactory service is placed in their hands by the competent authorities." Applications under section 4 would require careful scrutiny.

Section 9 enabled the council at last to discard the obsolete description "Colonial" practitioners and to use the description "Commonwealth" practitioners for

persons registered by virtue of qualifications granted elsewhere in the British Commonwealth. The object of section 8 was to permit visiting teachers and postgraduate students who take temporary posts in hospitals in the United Kingdom to enjoy the status of registered medical practitioners for the purposes and for the duration of their appointments: "it will relieve a number of practitioners who are welcome guests here, some already eminent and all qualified elsewhere, from the position of being 'unregistered persons' which some of them have felt to be invidious, and will at the same time relieve the hospitals, their hosts, from certain anxieties arising out of that position."

In conclusion the President expressed the council's hope that time may be found during the next session of Parliament for the passage into law of a Bill amending the Medical Acts on the lines of the draft submitted by the council to the Minister of Health. This short draft Bill included not only important provisions based on recommendations of the Goodenough Committee, but also provisions giving practitioners a right of appeal to the courts against penal erasure from the Medical Register; giving the council statutory power to restore the names of practitioners to the register after penal erasure; enabling the council to take evidence on oath and to compel the attendances of witnesses by subpoena; and enlarging the direct representation of the profession on the council.

#### DISCIPLINARY CASES

After considering cases already dealt with by the Dental Board, the council proceeded on Tuesday to reconsider a number of disciplinary cases in which medical practitioners were required to furnish evidence of good conduct. The sessions continued on subsequent days.

## Disabilities

### 5. CEREBRAL PALSY

CEREBRAL palsy, followed just before my second birthday by infantile paralysis, made me the peculiar child of all peculiar children. Walking, talking, all hand movements, and all my being have been difficult, even hazardous. Yet I have been able to do many things which, to others more than myself, seemed almost impossible—not merely to talk but to lecture and preach, not only to get myself around in an invalid carriage but to ride a bicycle, drive a car, and manage a horse. Notwithstanding unsteady hands, I have converted my own trees to useful bookcases. But I have not achieved all I have wanted to do. I wanted to fulfil what I perceive as a call to holy orders, yet the difficulties of handling the sacrament have, for the time being, made this impossible. Again, though I have lately achieved one ambition in getting married, this has raised new problems some of which have not yet been solved.

My life has been and is total war against physical affliction. Though in one sense I have fought alone, in another I have allies all round me, willing sympathetic friends, and above all the grandest wisest parents that any child could wish for, now urging me forward, now holding me back, seeing the conflict more clearly away from the heat of battle. And it would be false for me to omit the important part that religion has played in the practical management of my life. I do not see its influence purely as a spiritual one; I see it as the triumph of matter through spirit rather than that of spirit over matter. The aid of God is at the hands of others, and to a much lesser extent in my own. Thus while acknowledging faith-healing as a practical way for the palsied and others, I mean not what is usually signified by this vague term but the grace-in-action which has given me the power to do common ordinary things, such as shaving, or ringing a pig's snout (not an easy operation for anyone), better than the doctors expected. To accomplish these things trial and error have been necessary. When told I cannot do a thing I have sometimes sit and think out my own way of doing it; and then I make this way as much like the normal method as I can.

One short reminiscence may illustrate what I mean by the triumph of matter through spirit, and why I cannot easily teach others what experience has taught me. As an infant I had had my inability to walk thrust at me by parents and nurse. One day I had been left alone on the grass to pick daisies round about me—or rather, claw them off with my ungainly fists. Then I saw one particular daisy ten yards away, far out of my reach, which somehow I wanted above all others on the lawn. I rose up and reeling like a drunkard propelled myself to that one daisy; my objective for the moment had been achieved. However, I had been seen; perhaps I could after all walk. Time with a therapist in front of a long mirror showed that I could. I had walked not for the sake of walking but for the daisy's sake.

This brings me to the difficult point. People ask *how* I managed to walk; *how* I manage to do all the things I do. The only honest answer is either "the skill of medicine," or, so far as I have done it myself, "I don't know." The ends are clear enough: I have wanted not merely to pick particular daisies but to do all the things which others do so easily. But the means? Practice, trial and error, daring myself, betting against long odds; fighting a hard fight, watching others, and being an everlasting mimic. Physical therapists have done much for me; but what I have done only seems to be the answer to Hobson's choice. If I had ever known what normal physical life is I might know how I have overcome and met my challenge, but it has been to me the only way and there it is.

I am now asked to give tips to others through their doctors. It seems merely platitudinous to beg the doctor to egg on the patient with cerebral palsy, to urge him to be as normal as possible. But here lies what seems to me the most important thing. Strictly speaking medicine concerns itself only with the means—with bodily function—but means by themselves won't help a man with palsy; you must first show him that a normal life is worth living and that there are Daisies to be taken out to dinner as well as daisies for infants to pick. You have to treat not so much a patient in bed as a young "impossible" recruit for a stiff battle. Do not hide the blood, the sweat, and the tears that must come in therapy. Having been made to do certain things I soon learnt the art of making myself do others—of steeling myself—to my surprise but even more to the surprise of those around me. The question ever before me is: Woeful Willy or Belligerent Bill? And the doctor's job ought to include all steps to prevent Woeful Willy getting a stranglehold over Belligerent Bill. Frustration, disappointment I know; often enough I seem to come to a dead end, an impassable bridge. Such frustration comes when least expected; the enemy breaks out once more when all seems quiet. If I am not careful my temper rises, the devil gets hold of me, and defeat seems inevitable. But somehow I fight on; for I have learnt to master my temper, and that is more important than learning to master palsy itself.

Of actual aids and particular methods I don't know that I can say anything useful. Drinking vessels with handles are preferable to those without; a large shaving-brush is better than a small one; and furniture, in particular a writing-desk, which is truly solid and firm rather than light and rickety makes life easier. But on the whole my ways of propelling myself about, bathing, eating and drinking, and so on are no different from those of other people, except that I do them in an ungainly manner. It is adventure and experiment—or is it God Himself?—that will show one the best way, provided always that physical activity is not looked on as an end in itself. The man with a palsy must never allow anyone to realise he is fighting. Nor must he fight for his own gratification but for some end he believes to be worthy. The means come to one.

## Reconstruction

### WHITLEY COUNCILS

DURING recent months the Government have proposed to the professional representative bodies of the various branches of the National Health Service that when the service starts it shall embody consultative machinery largely based on the Whitley model. But, though the Civil Service now has more than 25 years' experience of the value of Whitley Councils, very few medical men, apart from those working whole time for central or local government, know much about the uses of these councils or the principles on which they work.

#### FUNCTIONS

The councils always consist of an official side, representing the State as employer, and a staff side representing the employees. The members are persons of standing (who may or may not be Civil Servants), chosen on the official side by the Government and on the staff side by associations or groups of associations officially recognised as representing the staff. Besides a National Whitley Council, which deals with questions affecting the Civil Service as a whole, there are departmental Whitley Councils concerned with matters affecting the conditions of service of the staff of the department. These include:

- i. Provision of the best means of utilising the ideas and experience of the staff.
- ii. Means of securing to the staff a greater share in, and responsibility for, the determination and observance of the conditions under which they work.
- iii. Determination of the general principles governing conditions of service—e.g., recruitment, hours, tenure, and remuneration, in so far as these matters are peculiar to members of the staff of the department.
- iv. Encouragement of the further and higher education of the staff.
- v. Improvement of office machinery and organisation, and provision of opportunities for full consideration of suggestions by the staff.
- vi. Consideration of proposed legislation as far as it has a bearing on the position of members of the staff.
- vii. Discussion of the general principles governing superannuation and their application to the staff.

In addition it is within the competence of the council to discuss matters concerning discipline and promotion. Thus it will be seen that the scope for discussion is very wide.

#### APPLICATION TO NATIONAL HEALTH SERVICE

So far as the health services are concerned, negotiation of the terms and conditions of service of the members of the different professions—in the public-health, the hospital, or the National Health Insurance Service—have so far been conducted separately, and difficulties have inevitably arisen through lack of coördination. The Government now seek to provide a structure which will:

- i. Enable those who are working in the National Health Service at every level to assist in improving its efficiency, and to feel quite certain that they are able so to do.
- ii. Provide an adequate and ready channel for consideration of the claims of any section of the persons employed and for remedying their grievances.
- iii. Give speedy decisions and combine with this speed the fullest possible coördination.

It is believed that joint consultative councils of the Whitley type, meeting regularly, will best fulfil these requirements. It is therefore proposed to set up nationally nine functional Whitley Councils, each concerned with the affairs of a particular profession or

group of professions, and one central council linking the work of the functional councils and able to consider matters concerning the service as a whole.

The nine functional councils will severally cover the following professions: (1) medical; (2) dental; (3) pharmaceutical; (4) optical; (5) professional and technical staffs "A" (including almoners, dental nurses and assistants, chiropodists, occupational therapists, physiotherapists, speech therapists, radiographers, psychiatric social workers, orthoptists, dietitians, remedial gymnasts, and psychologists); (6) professional and technical staffs "B" (including hospital engineers, dental technicians, laboratory technicians, dispensers, and catering officers); (7) nurses and midwives; (8) administrative and clerical staff; and (9) ancillary staff (including domestic workers, porters, ambulance staff, and home helps). It is expected that many, if not all, of these nine functional councils may find it necessary to set up their own standing committees to watch over the needs of each well-defined interest within the council's professional range.

The employer side of the central council will be representative, in varying proportion, of the Ministry of Health, the Department of Health for Scotland, the regional hospital boards, the boards of governors of teaching hospitals, the County Councils Association, the Association of Municipal Corporations, and the London County Council. Most of these organisations will likewise be represented on the employer side of the functional councils, which will also, where appropriate, include representatives of other employing bodies such as the local executive councils.

On questions of policy, if Civil Service procedure is followed, the aim will be to reach agreement. In default of agreement a decision will be recorded if two-thirds of the members present have voted in its favour. Decisions taken by central or functional councils will for practical purposes be effective, in that they will almost always be acted on; but constitutionally they will have to be put forward as recommendations to the Ministry or department concerned. To deal with matters which Whitley Councils have been unable to decide, special negotiating machinery will be set up.

While the central council will coördinate the work of the functional councils, and will be a meeting place for common problems, it is not intended to become an extra negotiating tier. Thus decisions reached by functional councils will not have to be approved by the central council before going forward as recommendations: there will be no question of debating all over again topics already thrashed out elsewhere in detail; with corresponding delay before decisions can be made effective; and there should be no fear that an agreement acceptable to a particular professional group may be upset by a body on which that group will have only minority representation. To ensure, however, that no functional council is unwittingly taking decisions that will prejudice the interests of, or be otherwise unacceptable to, another professional body, it is suggested that the minutes of the functional councils shall be circulated to the secretaries of each of the other councils. As both sides of each council will have their own secretaries, this should mean that no group remains unaware of the proceedings in other councils. It will always be permissible to raise matters of common concern in the central council, or to call, if preferred, joint meetings of two or more functional councils, and it should thus be possible to satisfy all interests and yet avoid long procedural delay.

All the councils so far mentioned will be dealing at a national level with general problems affecting their particular professions. It would obviously also be advantageous if at an area, or regional, level there were machinery for consultation between the larger employing

bodies of the health service and their employees. The general medical, dental, and pharmaceutical services are fortunate in that the local executive councils are themselves, by statutory constitution, to all intents and purposes joint consultative councils—with official and staff sides—enjoying full executive power. But on the regional hospital boards no such adequate provision for staff representation has been, or could be, made and it has therefore been proposed that each board shall set up its own regional hospital Whitley Council, whose functions shall be:

- i. To secure the greatest possible measure of co-operation between the regional hospital board and its employees, with a view to increased efficiency in the public service, combined with the well-being of those employed.
- ii. To deal with any questions arising from the local application of agreements reached by the National Whitley Council for the health service.
- iii. To deal with any local issues arising between the regional board and its staff.

The official side will include members appointed by the regional hospital board from among its own members and officers. The staff side will comprise representatives of those organisations represented on the functional councils which have members employed by the regional board and wish to be represented. Regional boards will also be asked to extend this principle of joint consultation to the hospitals under their charge, and encourage the establishment of consultative councils in individual hospitals or (if found more satisfactory) in the group of hospitals coming under a single management committee.

#### PROGRESS OF THE SCHEME

These suggestions were originally made many months ago. With the important exceptions of the medical and dental professions (which have deferred comment pending the conclusion of other negotiations in which they were engaged with the Ministry of Health), most of the professions whose views were invited gave ready approval of the principles outlined. In many cases the nomination of members, and the appointment of chairmen and secretaries for the staff sides of the respective councils are far advanced.

## Medicine and the Law

### Damages Awarded Against Surgeon

DAMAGES of £7000 against a surgeon were recorded at the Manchester Assizes in *Wilson v. Kitchin and Gould* on May 13. A five-year-old boy underwent a manipulative operation for knock-knee. His leg was afterwards placed in a plaster case which proved to be too tight; paralysis and wasting of the leg followed and the result was a club foot. Through his father, he sued the surgeon and the practitioner who had attended him. The sum awarded was offered on behalf of the defendant surgeon in settlement of the claim. The judge stated that the claim against the practitioner must fail; the surgeon thereupon undertook to pay the practitioner's costs, which were included in the judgment.

This was presumably one of those cases where, there being no suggestion of mere accident, the facts spoke for themselves and set up an irresistible inference of want of care. Mr. Justice Stable mitigated the adverse verdict by observing that the case against the surgeon was not one of lack of professional zeal or of unethical conduct. "A man who has come through a long professional life and has never made a mistake is, as Napoleon said, a man who has never made anything."

ON May 18 Mr. Lewis Douglas, the American Ambassador, presented the United States Medal for Merit to Sir Alexander Fleming, F.R.S., and Sir Howard Florey, F.R.S.

## In England Now

### A Running Commentary by Peripatetic Correspondents

THERE is a certain splendour about visitors' day in our colonial hospital, where sick visiting is enjoyed as much for the social life it engenders as from compassion for suffering relatives. By mid-morning every Sunday a boisterous and excited crowd is assembled outside the hospital gates, clad in a startling variety of clothes and hats. Sellers of fruit, sweets, and toys add to the gaiety of the scene, and the ice-cream man's persistent bell increases the gala atmosphere.

Towards noon a splendid figure appears—a coloured mounted policeman clad in blue and scarlet and seated on a large black charger. With imperial gestures he attempts to control the crowd, but it presses ever more thickly against the gates, and the tumult becomes deafening. At midday precisely a naval bell is rung solemnly three times, the gates spring open, and the crowd, with a roar that has startled many a nervous paying patient from his bed, surges forward like a gigantic wave, submerging doctors, nurses, and patients in a tide of good will, paper bags, and curiosity, and making the dull grey hospital look like a fair-ground.

In some places nowadays a young doctor's hope of advancement seems to depend on his mastery of some optical, electrical, or mechanical apparatus, the deployment of which at every opportunity will certainly provide material for learned discussion or perhaps publication, and may very occasionally have some diagnostic or therapeutic value. This cult of the pet contraption may account for the curious experience which befell your backroom correspondent the other day during an incursion into the sacred precincts of the Medical Unit.

On asking for the H.P. I was directed to a small side ward, where I found the young hopeful fussing at the foot of a step-ladder with a pair of beakers, one containing a colourless and the other a yellowish fluid. At the top of the ladder crouched a second white-clad figure, bespectacled and wearing the serious mien of a registrar; he was sucking vigorously through a system of glass and rubber tubes connected with the aforesaid beakers. I looked on in wonderment, imagining that this must be some new development of the hookah, designed to mitigate the discomforts of the tobacco-tax or of status asthmaticus, but on inquiring for details I was informed that I was witnessing an estimation of the specific gravity of a sample of urine. Fearing that some red-hot preliminary communication refuting the venerable Archimedes had perhaps escaped my notice, I hastened to ask what was the objection to the common-or-garden urinometer. The answer came with solemn emphasis and finality: "This is much more convenient."

Low down and rather towards one corner of the David Cox room at Walker's Galleries, where the exhibition of the Medical Arts Society is showing until June 1, is R. Hallam's "Circus Rider." But this is not the usual assemblage of reds and yellows, circus types, and coryphées. Hallam saw his circus rider from behind and a little below as he was in the act of changing horses in a darkened ring. Painted with the technique of pointillisme, but in a strangely small range of colours, the muscular figure in dull violet crouches in the dusty beam of the spotlight and gathers itself for the leap. The shadowy heads of the ringmaster and the crowd show as they might to him—the context merely of his own controlled and rhythmic pattern.

Most medical painters are less ambitious. A. B. Hewlett's sunless "Landscape, North London" is a peaceful grouping of subdued colours, while his "London Gardens," no less overcast, is so stereoscopic that one is tempted to step in behind the plane trees and peer out at the visitors. Sir Henry Bashford has contributed two of his ghostly little drawings, one a March study made at Hampstead, and the other—very successful—seemingly drawn under water in a rock pool. R. W. Payne, who says anyone can have perspective if they will leave him the paints, shows two water-colours as bright as toys—"Bookshelves" and "Colour Town"—where translucent reds and greens and blues set each other off, and



give a keen and naïve pleasure. They have something, but not very much, in common with Herbert O'Shea's "Polperro" which recalls Victorian pictures painted on the back of glass by seafaring men. Many doctors, however, have been content to give a standard subject orthodox treatment. "The Stack" by T. Holmes Sellors, Reginald Morshead's "Montpellier Walk," the grey-green and the daffodils of Hugh Stannus's "Pollensa, Mallorca," Henry Wilson's "Coming Storm," the Sunday quiet of E. Topham's "Iver Bucks," and Helena Wright's bright memories of Sicily are all good examples; and C. A. Pannett's cattle, in a tempered shade of strawberry-ice, grazing among light and dark woods, remain in the eye. H. H. Lake's etching of a horse, T. W. Lloyd's "Cleveland Farm" (a nice experiment with scraper board), W. S. C. Copeman's "Cape Matapan," E. S. Perkins's "African Biscuit Seller" with the light striking across his upper lip, and all six examples of sculpture deserve attention. "The Congo in the Rainy Season," as seen by Charles R. Porter, surprisingly recalls the river Glaslyn flowing ("like vaseline," as a poet said in his childhood) through North Wales, where the season is generally rainy.

\* \* \*

The meetings of the Association of Physicians are always good fun, and anyway one is eliminated from membership if one misses two successive sessions, so I travelled up to Liverpool on Friday. We arrived in time to attend what must have been one of the most comprehensive clinical demonstrations on record, for in addition to the resources of the university schools those of the tropical faculty were also drawn on. To me the major interest of the patient cured of leprosy with 'Diasone' lay in the amazing account of his life as the sole European in a leper colony, with which he regaled some of us subsequently—an exotic page for the records of Social Medicine. Cases ranged from "worm-eaten skull" through Charcot's joints; dermatomyositis simulating rheumatoid arthritis; to xanthomatous biliary cirrhosis, dystrophia myotonica, and a rare case of the Thibierge-Weissenbach syndrome, whatever that may be. It was too hot to emulate Dr. Parkes Weber's grimly avowed intention to "Go thoroughly into each case before dinner," for 77 more were listed.

The "banquet" was a model of uniformity; 250 members arrived in dinner jackets and only 2 were arrayed—no doubt for reasons connected with coupons—in "Bevan Blues." The Archbishop of Liverpool spoke eloquently on the merits and demerits of physicians as exemplified in the Law and the Prophets, stimulated thereto by a witty and iconoclastic diatribe from Prof. Robert Platt. Then came the most important aspect of such meetings: small groups forming and re-forming around glasses of beer until the small hours.

Saturday morning sunshine was soon lost sight of in the resumed session at the Medical Institute. As compensation, however, never have papers been so well presented—audible, learned (but often perfectly comprehensible), and fifteen minutes to the second. The subjects again covered a lot of ground, from the effect of urea on appetite to "honeycomb" lungs. I crept out about half-time to renew friendship with the cathedral, the most magnificent modern building in the world. Also to refresh my memory of the wording on the simple mural plaque which faces Lord Derby's elaborate monument: "Here lies in honour all that can die of a pioneer in orthopaedia; Sir Robert Jones, baronet." Then back to the meeting in time to hear about gastric ulcers in bus-drivers; a hasty conducted tour by a colleague to the new occupational-therapy "set-up" in the arthritic department of Broadlands Hospital, and so breathless and lurchless into the 2.5 P.M. train southward.

\* \* \*

The howlers of the candidate are perhaps *vieux jeu*; but what of the examiner's failings? The following startling question was recently submitted for a State-sponsored examination.

"What would lead you to suspect that a woman in the early months of pregnancy might be a hydatidiform mole?"

It seems to me that wholly correct answers might vary from "nothing on earth" to "one over the eight."

## Letters to the Editor

### THE CAMBRIDGE MEETING

SIR,—The Cambridgeshire and Huntingdonshire branch of the British Medical Association is looking forward to the honour of holding the first annual meeting of the association following upon the war. The organisation for this meeting has been a formidable problem, particularly in the matters of accommodation, feeding, and transport. It is very important for us to have, as soon as possible, a rough estimate of the numbers likely to attend, in order that firm bookings may be made.

So far the response to the notices which have appeared in the *British Medical Journal* has been disappointingly small. We believe that this is due to the fact that very many members have not realised the importance of making early application.

I should be glad, therefore, if you would allow me to use your columns to bring this point to the notice of all medical men who intend to attend this important meeting.

LIONEL WHITBY

Cambridge. President Elect, British Medical Association.

### MASTOID SURGERY—OLD AND NEW

SIR,—In your issue of May 8, and in the *Journal of Laryngology and Otology* for May, Mr. Tumarkin states his objections to the radical mastoid operation and seeks to convert otologists to his operation of transmeatal attico-antrotomy. He makes out a good case for his operation in the type of chronic disease which he especially describes (chronic suppurative otitis media with a postero-superior perforation and the mucosa of the tympanic cavity so mildly diseased that there is possibility of its returning almost to normal, and with the tympanic structures still capable of useful sound-conducting functions). His good results, as reported, support his contentions and I do not wish to comment on its use in this type of case.

In my experience, however, this type does not form such a large proportion of the cases of chronic suppurative otitis media not responding to conservative measures as Mr. Tumarkin suggests. Too much emphasis has lately been put on caries of the tympanic ring as alone being the reason why such cases resist conservative treatment. I have often found at operation a tympanic mucosa converted into granulation tissue, and in such cases I cannot see how anything less than exenteration of the tympanic cavity can be expected to eradicate the chronic sepsis; this leaves a cavity which requires a lining of skin—in other words, a radical operation. The same applies to cases of persistent chronic suppuration with severe deafness and extensive destruction of the drum-head. There is also the case (particularly with cholesteatoma) where the mastoid bone is more extensively involved—although I entirely agree that in the majority of radicals one meets nothing but sclerotic bone until nearing the antrum.

Mr. Tumarkin mentions the well-known objections to the "classical" radical procedure; the difficulty of obtaining a completely epithelialised cavity by the use of plastic flaps, and the disadvantages to the patient of such a large cavity (even if perfect healing is obtained) are freely admitted. But there is an excellent method of removing all diseased bone and mucosa and obtaining a final result in which there is merely a healed cylinder of skin continuous with the membranous meatus. This was described by Mr. M. R. Sheridan, of Truro, in the *Journal of Laryngology and Otology* for October, 1943. I learnt it from him and saw several of the cases he reported. It consists of performing the "classical" radical operation but very carefully leaving the cutaneous meatus *in situ*. The postaural wound is sutured, and by simple meatal dressings the edge of meatal skin left when the drumhead is removed is allowed to grow into the tympanic cavity and eventually to cover its walls. It is important to avoid damaging the meatal skin when taking down the "bridge"; and during dressings to prevent a granulation entering the tympanic cavity via the antrum. Little notice was taken of the paper at the time—I suspect because of the simplicity of the procedure—but I would urge otologists to try it. My own work has been at

several hospitals over the past few years, but in the last 20-30 cases treated in this way I have never failed to obtain this healed skin tube—not even in “complicated” cases which had necessarily to be “left open” for some days. (A proportion of the patients—as in Mr. Tumarkin's series—had some eustachian discharge, but there are mucous glands in the tube, and if this remains patent some mucous discharge is to be expected. Many otologists have tried methods of assuring eustachian closure in the radical operation, but I have read of no claims of universal success.)

To sum up, there is great need for an operation which will eliminate sepsis and preserve hearing in cases where the tympanic structures can still serve a useful sound-conducting function, and it is to be hoped that other otologists will confirm that Mr. Tumarkin's operation, in selected cases, is more successful than the many so-called “modified radical” operations that have been proposed in the past—and usually abandoned in the course of time. But in cases where the condition of the tympanic and/or mastoid structures makes a radical procedure necessary, I would urge otologists to try Mr. Sheridan's operation with conservation of the cutaneous meatus.

31st British General Hospital,  
British Troops Austria.

NORMAN A. PUNT.

#### BELGIAN TRIAL OF STREPTOMYCIN

SIR,—Since the publication of the Medical Research Council report on streptomycin in tuberculous meningitis, I have received from Dr. Dubois, of Brussels, a report published in November, 1947, but which I had not seen previously, concerning the trials conducted by him and his co-workers.<sup>1</sup> The results reported from Brussels are superior to any published elsewhere (with the exception of a small series by Lincoln in New York) and I hasten to bring them to your notice.

Dubois reports on the condition, five months after commencing treatment, of 24 patients with tuberculous meningitis treated with streptomycin by both intramuscular and intrathecal routes; 5 patients had died, 2 were seriously ill, and 17 were making good clinical progress and were without signs of meningitis apart from a persistently abnormal cerebrospinal fluid. Doses similar to those given in the M.R.C. trials were employed. The main difference was in rhythm of treatment, particularly in the long periods during which treatment was suspended completely. The regimen was as follows: 45 days combined therapy (intrathecal daily); 20 days rest; 20 days combined therapy (intrathecal daily); 20 days complete rest; 30 days combined therapy (intrathecal every 2 days).

It is stressed in the report that the results given were those observed at the end of five months, and that these results were modified in patients observed for a longer period, by a number of late relapses. The course of the disease in a second five-month period is to be reported in a later paper.

London, W.C.1.

MARC DANIELS.

#### INFECTIONS OF THE HAND

SIR,—I have read with great interest the article of May 22 by Professor Pilcher and others. I have waited for a long time to hear authoritative doubt cast on the mechanical theory of terminal phalangeal necrosis. It is also refreshing to hear the conservative treatment of infected hands preached from so distinguished a pulpist.

At this hospital we are fortunate in being able to admit all but the most trivial cases of infected hands. Their treatment stands on a firm tripod of rest, elevation, and systemic penicillin. Resolution is the rule, but if the abscess points, the pus is evacuated through a minimal incision. As your contributors point out, the “classical” incisions advocated by Kanavel and others have no place whatever in modern treatment. During 2½ years here as registrar and then chief assistant to a busy surgical unit, I can recollect only one case in which necrosis of the terminal phalanx resulted from a pulp-space infection, and only one patient who was left with stiffness of her terminal interphalangeal joint. As we seldom have less than half a dozen “septic fingers” in our wards, such results prove fairly conclusively the value of conservative

treatment. Success is due to the fact that in this unit infected fingers are all regarded as surgical cases of the first magnitude.

There was undoubtedly a time when much havoc was wrought by inadequate surgery. Unfortunately the pendulum swung too far, and it may be as difficult to erase those mutilating “hockey stick” and other “classical” incisions from the minds of modern surgeons as it was to instil them into the surgeons of the past.

Ashford County Hospital,  
Ashford, Middlesex.

ROBIN BURKITT.

SIR,—In the first eight months of last year 528 septic hands were treated in the hand clinic at this hospital, of which 80 were pulp-space infections. Of these, 62 were recorded fully enough for review. Of 18 treated by the orthodox incision or incisions within three days of onset, none developed osteitis of the phalanx. Of 44 first seen four or more days after onset, 13 had or developed osteitis, with delayed convalescence and (in some) permanent deformity.

I feel that Professor Pilcher pays too little tribute to the care and enthusiasm devoted by himself and his colleagues to the cases he describes. Septic hands, whether treated according to his principles or according to more “orthodox” ones, will get well much more rapidly if they have the benefits of personal frequent attention from experienced surgeons, continuous supervision of dressing technique, plenty of time (as, for instance, for nerve-block anaesthesia), and the professorial authority which provides inpatient treatment when required.

Under the conditions at present obtaining in the majority of hospitals, however, I regard it as inadvisable generally to adopt the conservative treatment of pulp-space infections, with or without penicillin; and, indeed, until all those who read Professor Pilcher's article can avail themselves of his facilities, almost dangerous to be aware of it. Most necrosed phalanges are due to attempts at “conservative” (admittedly inadequate) treatment on the part of the patient, his home doctor, or an overworked understaffed casualty department. For some time to come, early incision, properly made, will confer the greatest good on the greatest number.

Royal Infirmary, Sunderland.

T. G. LOWDEN.

#### PRIMARY ATYPICAL PNEUMONIA

SIR,—I should like to suggest that the outbreak of primary atypical pneumonia reported by Dr. J. W. Stephens in your issue of May 8 was caused not by a virus but by the *Rickettsia burneti*, the causative agent of Q fever and of “Balkan gripe,” a similar respiratory infection occurring in Greece and Southern Europe. As Dr. Stephens says, Q fever was later found to have been the cause of several outbreaks of acute upper respiratory infection in Italy during the winter of 1944-45, though this fact was not recognised by him at the time.

The cases which he describes are similar in many respects to those reported as primary atypical pneumonia by Turner<sup>1</sup> and by Adams et al.<sup>2</sup> Several similar outbreaks, including one in a British parachute regiment that had recently been transferred from Athens, were investigated at the same time by a team of American workers (Robbins and Rustigan<sup>3</sup>). The diagnosis of Q fever was confirmed by the isolation of *R. burneti* from the blood and by serological tests. It was also shown that approximately 75% of cases of “atypical pneumonia” occurring in Italy were, in fact, cases of Q fever. The cases reported by Dr. Stephens occurred in March, 1946, a year later, at about the same season (January-March) and in the same area (Naples-Caserta). Furthermore it was shown by the American workers that quite a high proportion of the civilian population in this area showed a high level of antibody to Q fever, suggesting that the infection was endemic (Commission on Acute Respiratory Diseases, Fort Bragg<sup>4</sup>). In view of these findings Caughey and Dudgeon<sup>5</sup> re-examined

1. Turner, R. W. D. *Lancet*, 1945, i, 493.

2. Adams, A. B., Staveley, J. M., Rolleston, G. L., Henley, W. E., Caughey, J. E. *Brit. med. J.* 1946, i, 227.

3. Robbins, F. C., Rustigan, R. *Amer. J. Hyg.* 1946, 44, 72.

4. Commission on Acute Respiratory Diseases, Fort Bragg. *Ibid.* 1944, 44, 103.

5. Caughey, J. E., Dudgeon, J. A. *Brit. med. J.* 1947, ii, 684.

1. Dubois, R., Linz, R., Leschanowski, H., Schlessner, R., Wattiez, R. *Acta paediat. belg.* 1947, 4, 193.

several of the cases previously reported by Adams and his colleagues, and were able to show that the majority (19 out of 20) still showed a significantly high titre to the Italian strain of Q fever. These complement-fixation tests were carried out some two years after the initial infection. Again there is a marked similarity in the clinical, radiological, and laboratory findings of all of these cases. It would be of interest to know whether Dr. Stephens noticed the macular rash, reported in the previous year, in any of his patients. The enlargement of the liver to which he draws attention may have been due to some other cause of hepatomegaly, such as malaria.

Owing to the diverse aetiology of atypical pneumonia and of non-bacterial respiratory infections in general, and partly owing to the difficulty of investigating such cases in the laboratory, our knowledge of the epidemiology and aetiology of atypical pneumonia is still limited. It is therefore important, wherever possible, to determine the aetiology in such cases. It would be of interest and of value, and even at this stage might be practicable, to know whether any of these cases still show a raised titre to the rickettsia of Q fever.

Louis Jenner Laboratory,  
St. Thomas's Hospital, S.E.1.

J. A. DUDGEON.

### BEDS FOR TUBERCULOSIS

SIR.—Because I urge consideration of the desirability of letting more patients out of bed to go to the lavatory and to wash, Dr. Yell and Dr. McDade accuse me of "advocacy of exercise in active tubercle." Surely not. Rest is still the most important single factor in the treatment of tuberculosis, and it is my contention that this fundamental principle could be carried out more completely if less of our nurses' precious time was consumed by the archaic tyranny of the régime symbolised by the bedpan. Certainly the patient should rest, but will he rest any the less if he is permitted to open his bowels naturally instead of poised precariously in bed? Nor am I advocating that our sanatoria should be run *à la Suisse*. But I would urge again that just as the Swiss have something to learn from us, we can and should also learn from them.

May I correct a possible real misconception arising from my article? Some may think that the British Sanatorium (Montana Hall) was included in my data. It was not. Though I called on my friends at Montana Hall I did not inquire into their clinical practice or their nursing ratios. These are well known to me and I have always looked upon this fine institution as a piece of Britain that happens to be situated in Switzerland rather than as a Swiss sanatorium.

London, N.W.11.

F. J. BENTLEY.

### WOMEN DOCTORS AND NATIONAL SERVICE

SIR.—It is common knowledge that there has been great difficulty ever since the end of the war in meeting the requirements of the Armed Forces for consultants and specialists; but the Medical Women's Federation understands that the Services committee of the Central Medical War Committee is now finding the same difficulty with regard to general-duty officers.

It will be remembered that, whereas during the war women doctors were conscripted with their male colleagues, this policy was reversed in 1945, since when no women at all have been called up. The Medical Women's Federation, with the support of the British Medical Association, has always upheld the principle that in medicine there should be no differentiation solely on account of sex, and has contended that this applies equally to duties and to privileges and that women doctors ought not thus to escape a liability which presses hardly on their male colleagues. Repeated representations have been made to the Government, and last year an unsuccessful attempt was made to get the National Service Bill amended during its passage through Parliament. The arguments raised against the conscription of women doctors have always appeared unconvincing to the Federation, but a difficulty in pressing the case has hitherto been that there were more than enough male general-duty officers available to meet the needs of the Services.

This situation is now entirely changed and it is understood that the Services committee of the Central Medical War Committee has had to consider new means of increasing the inflow of general-duty officers to the Services. The Medical Women's Federation wishes again to express its opinion that the newly qualified women doctors ought to take their share of the burden, and that they would provide a not inconsiderable contribution to the requirement. It is understood that a recommendation on these lines has been made by the Services committee of the Central Medical War Committee to the Medical Priority Committee. This would involve legislation to render women doctors liable to national service, but the principle at stake is so important and the immediate need so urgent that the Federation does not feel that this is an insuperable difficulty. It reaffirms the desire of women doctors to share fully all professional liabilities.

MARY F. LUCAS KEENE  
President,  
Medical Women's Federation.

73, Bourne Way,  
Hayes, Bromley, Kent.

### TERMS OF SERVICE

SIR.—Your leading article of May 15 emphasises some of the many things that need doing before there can be a smoothly running service; but it omits all mention of one thing—namely, the terms of service of hospital staffs not covered by the expression "specialist."

It is surely obvious to all that the present scales of salaries in voluntary hospitals cannot continue in a nationally run service, and also that the Askwith scale, even with its revisions, bears no relationship to present conditions. Up to date, however, the Negotiating Committee has not felt it desirable to widen its negotiations with the Minister to include these doctors. This may have been right a year ago but I do not feel that it is so today.

Another point that needs consideration regarding this class of doctor is his representation vis-à-vis the boards of governors and the regional hospital board. The B.M.A.'s suggestion of a Regional Specialists Committee is excellent, but this committee is not in a position to speak for anybody not classed as a specialist. One superintendent and three co-opted registrars can hardly alter that fact.

There would seem to be a strong case for regional medical associations such as those started in the Welsh and Liverpool regions.

V. COTTON-CORNWALL  
Hon. Secretary, Liverpool Regional Hospitals  
Medical Association.

Liverpool, 9.

### ALEUDRINE AND ANTHISAN IN BRONCHIAL SPASM

SIR.—Our results with 'Aleudrine' support the conclusions which Dr. Herxheimer draws in his important paper of May 1. There is no doubt that this is a potent addition to our drugs for the treatment of bronchial spasm. The limiting factor in the use of aleudrine is its action as a cardiac stimulant which may give rise to unpleasant palpitations and may thus be a contra-indication to its use when cardiac disease is present.

After a careful study of the evidence which he presents we are unable to agree with Dr. Herxheimer's conclusions with regard to 'Anthisan.' In 11 of the 14 cases on which he did vital-capacity studies the increase in vital capacity was less than 400 c.cm. and in 7 it was less than 300 c.cm. Since there were no control studies with dummy tablets we doubt the significance of these results. Levy and Seabury<sup>1</sup> interpreted such low readings with caution, and in 6 of their 15 cases studied in the same manner there was actually a decrease of vital capacity when 'Benadryl' was given, and in 3 of these cases the decrease was as much as 500 c.cm. Considering all the variable influences involved in naturally occurring bronchial spasm, vital-capacity alterations of less than 400 c.cm. are probably of little significance.

Dr. Herxheimer says in his introductory paragraphs: "There can therefore be no constant condition as a basis for the investigation." This may not be entirely correct. Curry and others<sup>2</sup> have shown that in broncho-spasm induced by histamine, 'Mecholyl' (acetyl-β-

1. Levy, L., Seabury, J. H. *J. Allergy*, 1947, 18, 244.  
2. Curry, J. J. *J. clin. Invest.* 1946, 25, 785, 792.

methylcholine chloride), or pollen in sensitive human subjects a remarkably constant degree of spasm can be produced by a given dose; surely this is the correct basis for assaying drugs in human bronchospasm.

In the clinical administration of anti-histamine drugs to 30 patients, Dr. Herxheimer reported no control studies. Similar work carried out by Southwell<sup>3</sup> with careful controls and assessment of results suggests that anti-histamine drugs are without value in asthma.

There is no supporting evidence for Dr. Herxheimer's conclusion that tolerance is easily acquired to anti-histamine drugs. Tolerance to the drugs has not been reported as a well-marked feature of their use in urticaria, and it has certainly not been encountered by us in a considerable series of patients suffering from chronic urticaria who have now been taking anti-histamine drugs for over two years.

Royal Infirmary, Edinburgh.

D. M. DUNLOP  
R. B. HUNTER.

#### SENSITISATION OF PENICILLIN-RESISTANT STAPHYLOCOCCI

SIR,—I have just read Dr. Winner's letter of May 15, stating that his results and mine might be explained as Dr. Barber (May 8) suggests. It may be true that his results can be thus explained, but not so mine. The facts put forward by Dr. Barber are not disputed, but when she visited me here a few days before her letter was published, I was able to show that my results were based on the testing not only of single colonies but also of broth cultures in bulk.

Wright-Fleming Institute of Microbiology, A. VOUREKA.  
St. Mary's Hospital, London, W.2.

#### PENICILLIN AND SULPHONAMIDE IN TYPHOID FEVER

SIR,—I agree with Dr. McSweeney (May 1) that it would be unfortunate to discard a promising form of treatment on inadequate evidence. I fully recognise the validity of his criticisms of my paper, and I had there pointed out the deficiencies to which he draws attention. When dealing with a disease so variable in its course as is typhoid, the successful treatment of 5 or even of 28 cases is insufficient evidence on which to base conclusions—unless, of course, the response to therapy has been specific. McSweeney's results, published in 1946, were undoubtedly suggestive, and we in the Middle East realised that we were in a position to give the new method an extensive trial. Therefore, "with a view to standardising the dosage and methods of administration of the therapeutic agents," I inquired whether any of our physicians were using penicillin and sulphathiazole in enteric fever. The replies to my questionnaire formed the basis of my paper.

The opinions expressed were so strongly phrased that I decided it would not be justifiable, at that time, to proceed with the field trial which had been contemplated. The suffering imposed on patients by repeated injections was described with deep feeling by all who replied to my letter. So graphic were these descriptions that they were censored by my colleagues at the War Office, and the paper which was published was consequently robbed of a dramatic emphasis which was important to its argument. Emotion should not be allowed to overrule reason, but I must emphasise that these expressions of opinion, which were unanimous and spontaneous, were extremely impressive.

I hoped that my paper might stimulate others to give their views of the treatment; only the combined findings of many observers will give the evidence necessary to assess the use of this method of therapy. Most physicians in the Middle East, civilian and military alike, seem to have been little impressed. Similarly the report of the Aberystwith epidemic<sup>4</sup> is unfavourable. The observations of Dr. Raoul Dana (May 1) on the other hand, give valuable support to McSweeney; and I am grateful to him for his letter and for directing my attention to his publications on the subject, which unfortunately had escaped my attention.

Birmingham.

CLIFFORD G. PARSONS.

3. Southwell, N. *Brit. med. J.* 1948, i, 877.

4. Bevan, G., Sudds, M. V. N., Evans, R., Parker, M. T., Pugh, I., Sladden, A. F. S. *Lancet*, April 10, p. 343.

## Obituary

### ROBERT OLLERENSHAW

M.D. MANC., F.R.C.S.

Mr. Robert Ollerenshaw, orthopaedic surgeon to the Salford Royal Hospital and to the Royal Manchester Children's Hospital, died on May 19 at the age of 65.

The son of Mr. George Ollerenshaw, of Glossop, he was educated at Manchester Grammar School and at Manchester University where he graduated M.B. in 1905, proceeding three years later to his M.D. degree, which he was awarded with special commendation. Meanwhile he had continued his studies at the London Hospital and in Berlin, and in 1909 he took the F.R.C.S. He returned to Manchester to hold house-appointments at the Royal Infirmary, and he was also for a time senior house-surgeon at the Liverpool Hospital for Children. After his appointment to the staff of the Salford Royal he settled in consultant practice in Manchester. His early published work deals with problems of abdominal surgery, but before the 1914-18 war his interest in orthopaedics had already been aroused, and he returned from service with the B.E.F., as a surgeon specialist to the 57th General Hospital, with greatly widened experience of his speciality. Soon afterwards he joined the staffs of the Royal Manchester Children's Hospital and the Booth Hall Hospital, and he was later appointed clinical lecturer in orthopaedic surgery in Manchester University.

For many years Ollerenshaw presided over the Manchester Surgical Society, and he was also a vice-president of the British Orthopaedic Association, and president of the orthopaedic section of the Royal Society of Medicine.

"Robert Ollerenshaw was a man of wide interests," writes H. P. "In his professional life the possession of private means enabled him to enjoy a selected type of consulting practice and to give single-minded devotion to his work at the Salford Royal and the Royal Manchester Children's Hospitals. The orthopaedic departments of both these hospitals were his unaided creation. Although at the Salford Royal he organised and directed a large fracture service, it was the orthopaedic problems of children which appealed to him most, and his main contributions to surgical literature lay in this field. They were always characterised by a scrupulous review of the writings of others and more particularly of the Continental authorities. He was an early pioneer in the use of cinematography for clinical and operation records, and in this work he had the valued collaboration of his elder son who is a camera artist of great talent.

"In his private life Ollerenshaw excelled as a host. A constant stream of guests made their way to his beautifully appointed house, presided over by his charming and vivacious Canadian-born wife. Her death left him a lonely man and he turned for solace to his love for music which went back to his student days. He became a member of the executive committee of the Hallé Concerts Society and soon was deeply immersed in the affairs of the new orchestra created and trained by John Barbirolli. Some years before the last war Ollerenshaw bought a lakeside villa outside Salzburg, and each year he spent August there, combining a restful holiday with the delights of the annual festival. With Salzburg no longer available he eagerly welcomed the chance of enjoying the first Edinburgh Music Festival. During the past two years he had begun to experience increasingly frequent attacks of angina after exertion; but he carried on quietly with most of his multiple responsibilities. He took the inevitable risk and his end came suddenly in the company of friends."

Mr. Ollerenshaw married in 1911 Florence Eleanor, second daughter of the late Hon. Robert Watson of Ottawa. She died in 1933 and they leave two sons.

### CYRIL HERBERT THOMAS ILOTT

M.A., M.B. CAMB.

THE death in Bromley on April 25 of Dr. Ilott has broken a family association with the town of nearly 150 years, for his great-grandfather went to Bromley in 1809 as one of the partners of Dr. Scott, still remembered eponymously in Scott's dressing. Since then one

or more members of the Ilott family has always been in practice in the town.

Cyril Ilott was born in Bromley in 1879, and was educated at Tonbridge School and Cambridge University. In 1906 he qualified from St. Bartholomew's Hospital, and before joining the family practice he was for a time house-surgeon at the Metropolitan Hospital, London. He served in the R.A.M.C. in France in the 1914-18 war, when one of his eyes was permanently injured by mustard gas, which also caused pulmonary damage. He was able nevertheless to return to thirty years of active general practice.

A life governor of Bromley and District Hospital, Ilott was chairman of its medical staff committee. During the late war he was in charge of the hospital's casualty arrangements, and he never failed to attend when air-raids and flying-bomb attacks brought casualties to the hospital. He was a member of the court of assistants of the Society of Apothecaries, and he served for many years as a member of the Kent local medical and panel committee. He married in 1912 Lucy Annette, daughter of the late Colonel E. Satterthwaite, and she survives him with three daughters.

Sir GEORGE BLACKER, consulting obstetric physician to University College Hospital, London, died at his home at Frensham, Surrey, on May 21.

## Diary of the Week

MAY 30 TO JUNE 5

### Monday, 31st

ROYAL COLLEGE OF PHYSICIANS, Pall Mall East, S.W.1  
5 P.M. Dr. Denis Williams: Symptomatic Epilepsy.

### Tuesday, 1st

ROYAL COLLEGE OF PHYSICIANS  
5 P.M. Prof. A. J. Lewis: Alcoholism.  
INSTITUTE OF DERMATOLOGY, 5, Lisle Street, W.C.2  
5 P.M. Mr. A. K. Monro: Varicose Eczema, Ulceration, &c.

### Wednesday, 2nd

MEDICO-CHIRURGICAL SOCIETY OF EDINBURGH  
8.30 P.M. (Royal College of Surgeons, 2, Nicolson Street, Edinburgh.) Sheriff-Principal T. B. Simpson, K.C., Dr. J. K. Slater: Medical Man in the Witness-box.

### Thursday, 3rd

ROYAL COLLEGE OF PHYSICIANS  
5 P.M. Dr. Janet Vaughan: Use of Radioactive Isotopes in Treatment.  
SOCIETY OF APOTHECARIES, Black Friars Lane, E.C.4  
5 P.M. Prof. John McMichael: Pharmacology of Heart-failure. (Strickland Goodall lecture.)  
INSTITUTE OF DERMATOLOGY  
5 P.M. Dr. G. B. Mitchell-Heggs: Eczema.

### Friday, 4th

ROYAL COLLEGE OF PHYSICIANS  
5 P.M. Prof. E. C. Dodds, F.R.S.: Modern Endocrinology in Diagnosis and Treatment.

## Births, Marriages, and Deaths

### BIRTHS

ARNOTT.—On May 14, at Sevenoaks, the wife of Dr. J. Arnott—a son.  
BROOKS.—On May 19, at Oxford, the wife of Mr. D. M. Brooks, F.R.C.S.I.—a daughter.  
CAPON.—On May 17, at Plymouth, the wife of Dr. John Capon—a son.  
CARTER.—On May 18, in Birmingham, the wife of Dr. David Carter—a daughter.  
CHESHIRE.—On May 21, at Wolverhampton, the wife of Dr. A. H. Cheshire—a daughter.  
LUSH.—On May 19, to Dr. Margaret Lush, wife of Dr. Brandon Lush—a daughter.  
MACCARTHY.—On May 18, the wife of Dr. Dermot MacCarthy—a son.  
PENISTAN.—On May 10, at Carlisle, the wife of Dr. John Penistan—a son.  
POWELL-TUCK.—On May 20, in Birmingham, the wife of Dr. G. A. Powell-Tuck—a son.  
WEINER.—On May 17, at High Wycombe, the wife of Mr. R. A. K. Weiner, F.R.C.S.—a daughter.  
WOTTON.—On May 16, in London, the wife of Dr. G. R. Wotton—a daughter.

### DEATHS

BEAUMONT.—On April 23, at Brandon, Suffolk, Edward Vincent Beaumont, M.B. Lond.  
HALL.—On May 17, at Coulsdon, Peter S. Hall, M.B. Camb.  
MACGILCHRIST.—On May 14, in Calcutta, India, Archibald Currie MacGilchrist, M.A. Glasg., M.D. Edin., M.R.C.P., colonel, I.M.S. ret'd.  
OLLERENSHAW.—On May 19, Robert Ollerenshaw, M.D. Manc., F.R.C.S.  
POLE.—On May 21, in Edinburgh, Laurence William Pole, M.B. Edin., D.P.H.  
TAYLOR-YOUNG.—On May 20, at Salisbury, Hugh Corbett Taylor-Young, O.B.E., M.D. Glasg., F.R.F.P.S.

## Notes and News

### RESEARCH INTO TUBERCULOSIS

LAST year the Tuberculosis Association decided to set up a committee to help in the coördination of research throughout Great Britain and Northern Ireland. This committee has now been set up under the chairmanship of Dr. F. R. G. Heaf, the association's president; it includes an observer from the Ministry of Health and representatives of the Joint Tuberculosis Council and the Tuberculosis Society of Scotland. It is hoped that investigators will keep the committee informed about work envisaged or in progress; all information will be treated as confidential. Besides giving assistance to research-workers when asked, the committee will be prepared to advise on the conduct of larger investigations contemplated by official bodies and manufacturers, to draw up schemes for trial of new methods of treatment, and to suggest to individuals or groups outstanding problems that might usefully be explored. The full committee will meet several times a year, and a standing working subcommittee is to consider questions as they arise. Communications should be addressed to the Tuberculosis Association Research Committee, Manson House, 26, Portland Place, London, W.1.

### A CONVALESCENT HOME FOR EPILEPTICS

CONVALESCENT homes in this country are unanimous in refusing to admit epileptics. This has meant real hardship to many people who are well enough to earn their own living or manage their own homes, but who cannot get the necessary rest and change after an illness. To meet this need a small convalescent home for epileptics has just opened in Ashdown Forest. Patients of either sex over the age of 16 are eligible. Inquiries should be addressed to the National Association for Mental Health, 39, Queen Anne Street, London, W.1.

### SCHOLARSHIPS FOR WARD SISTERS

GOOD nursing turns on good ward sisters, and King Edward's Hospital Fund for London is taking pains to recognise this neglected fact. Recently asked to award a scholarship for one of the courses for trained nurses arranged by the Florence Nightingale International Foundation, it has decided to offer £350 for a year's course designed to encourage trained nurses to remain in actual ward work.

The scholarship will be open to trained nurses on the staff of hospitals in the fund's area, or offered posts in such hospitals on their return. The course must be suited to prepare the nurse for work as ward or departmental sister, preferably in some specified branch. The scholarship will be either for one of the recognised post-certificate courses available in Canada or elsewhere, or for observation and research in hospitals in any country where suitable experience is to be had. It covers tuition fees and board and lodging, and allows a small sum for expenses, but does not normally include the fare.

Application forms may be obtained from the Secretary, Nursing Recruitment Service, 21, Cavendish Square, London, W.1, and should be returned completed before June 14. Hospitals are invited to nominate members of their nursing staffs.

### THE SLEEPING DENTIST

"KEEP a thing for seven years," the old wives used to say, "and you will find a use for it." Dr. Claude Lillingston, in the May issue of *Blackwood's Magazine*, tells of a dormant skill he kept far longer than that before he could display it. Informed in student days that a country doctor's reputation hinged on dental extractions, he put in his Saturday mornings at the dental clinic, learning the knack. Soon, he says, it was like shelling peas. Then he qualified and never drew another tooth for forty years. The time came when he found himself in a remote fjord of Norway. The local doctor fell sick, and he offered his services; and some hours later was at the head of a lonely valley faced with half a dozen patients. In a practical and experimental spirit the elders pushed forward a boy with toothache, the guinea-pig whose fate would decide the reputation of the doctor.

"There we faced each other," he writes, "both in a funk we tried to hide." But the sleeping skill stirred in him. "In front of the lad's fellow-patients I felt his tooth—a premolar in his lower jaw—with the fingers of my left hand, letting no-one see the dental forceps in my right. It was all over in a flash. A quick gasp, and then the rattle of a tooth, a whole tooth, in a bucket on the floor. 'Next patient!' I said in a matter-of-fact voice."

How pleasantly our motor patterns back us up.

### MEDICAL DIRECTORY

THE awkward dichotomy to which objection was raised last year<sup>1</sup> has been abolished in the *Medical Directory 1948*,<sup>2</sup> part I now dealing with London, Scotland, Ireland, Abroad, Services, and Practitioners Temporarily Registered in Great Britain, and part II with Provinces and Wales—a much more convenient arrangement. The regional hospital boards are now listed for the first time, those for England and Wales at the end of the London section, and the Scottish ones at the end of their respective section. Since last year's directory was published there has been a net increase of 1626 names of practitioners.

### AN OLD MEDICAL CABINET

In some ways the 18th century, so full of lively and inquiring minds, seems more akin to our own age than the 19th; and it is therefore startling to realise how primitive in some ways was therapeutics at that time. Among the exhibits to be shown at Queen's College, Cambridge, in honour of its 500th birthday, is a medical cabinet which once belonged to John Francis Viganì, appointed first professor of chemistry to the university in 1703. Viganì was a Veronese, and little is known of his early life; but he was in England in 1682, and the first edition of his book *Medulla Chymica* appeared in Danzig in the same year. At the invitation of the Master of Trinity, Viganì used the newly fitted Trinity College laboratory, and delivered his professional lectures there. The 600 specimens of drugs in his cabinet correspond with the list issued by the College of Physicians for the guidance of 18th century apothecaries, and include so-called dragon's blood (now used by French polishers), precious stones such as amethyst, topaz, garnet, ruby, jet, pearl, and sapphire, as well as manna, myrrh, opium, quinine, musk, viper, scorpion, and the claws of crabs.

The exhibition is to be opened on June 7.

### University of Cambridge

On May 15 the following degrees were conferred:

*M. Chir.*—L. L. Bromley.

*M.B., B.Chir.*—M. T. Gillies,\* H. W. H. Kennard.\*

\* By proxy.

Dr. G. P. Stoker, of Sidney Sussex College, has been elected into an official fellowship at Clare College.

### University of Sheffield

Dr. John Colquhoun has been appointed honorary lecturer in bacteriology.

### Queen's University, Belfast

The Nuffield Provincial Hospitals Trust has made a grant of £30,000 through the Northern Ireland Regional Hospitals Council to the centenary fund of the university to endow a chair and department of child health. As the government of Northern Ireland has offered to contribute pound for pound the total endowments of the chair amount to £60,000.

### Royal College of Surgeons of England

On Thursday and Friday, June 24 and 25, at 5 P.M., Prof. Arnold Sorsby will lecture on the Dystrophies of the Retina and Choroid.

### Royal College of Surgeons of Edinburgh

At a meeting of the college held on May 19, with Mr. Frank Jardine, the president, in the chair, the following were admitted to the fellowship:

C. R. S. Davidson, E. O. Dawson, Thomas Dean, D. M. Douglas, A. K. Dutt, H. D. Fairman, Julius Fine, L. B. Gottlieb, K. S. Grewal, E. G. Hardy, G. D. Jack, Z. A. Karim, Stephen Kavanagh, H. G. Khalsa, I. S. Kirkland, J. M. Large, A. J. Leonis, D. G. Lloyd-Davies, E. J. Marais, J. M. Megaw, N. V. Mody, O. D. Morris, R. A. McCluskie, A. B. MacLean, J. A. Orr, Kyeec Paw, H. N. Perkins, W. R. Phillips, M. C. Pinkerton, E. H. Rainer, P. M. Roemmle, A. K. Saha, A. I. Sahyoun, M. M. El D. Said, S. N. Sarma, O. J. Shah, W. D. Sharpe, B. J. Shaw, C. J. C. Smith, P. B. Sulakhe, Ronald Vaughan-Jones, Osman Wahby, Peter Wilson, L. E. Wood.

### Oxford Graduates' Medical Club

The club will hold its first dinner since the war at Christ Church, Oxford, on Friday, July 16 at 7.30 P.M. Prof. A. W. M. Ellis will be in the chair. Applications for tickets should be made to Mr. E. A. Crook, 149, Harley Street, London, W.1, not later than July 1.

1. *Lancet*, 1947, 1, 813.

2. London: J. & A. Churchill. 1948. Pp. 2640. £3 3s.

### Faculty of Homœopathy

On Thursday, June 3, at 5 P.M., at the London Homœopathic Hospital, Great Ormond Street, W.C.1, Dr. Elizabeth Paterson will speak on Worm Infestation in Children.

### Royal Sanitary Institute

The John S. Owens prize has been awarded to Dr. R. E. O. Williams, for his essay on the Ventilation of Dwellings and Its Effect upon Human Health.

### International Congress of Otolaryngology

The British Association of Otolaryngologists is organising the fourth International Congress of Otolaryngology, which is to be held in London from July 17 to 23, 1949. There will be further meetings at Oxford, Cambridge, and Edinburgh on July 25 and 26. Further information may be had from Mr. F. C. W. Capps, 45, Lincoln's Inn Fields, W.C.2.

### Medical Superintendents' Society

The annual general meeting of the society will be held at the Royal Hospital for Sick Children, Glasgow, on Thursday, June 3, at 10.30 A.M. The president-elect is Dr. H. Stanley Banks. Mr. Walter Elliot, M.P., will be the guest of honour at the dinner which takes place on Friday, the 4th, at 7.30 P.M., at the Central Station Hotel, Glasgow.

### Empire Rheumatism Council

A weekend course will be held at the Apothecaries' Hall, Black Friars' Lane, London, E.C.4, on June 12 and 13. The lecturers will include Prof. Henry Cohen, Dr. George Graham, Dr. Ernest Fletcher, Dr. W. S. C. Copeman, Dr. W. S. Tegner, Dr. F. S. Cooksey, and Dr. J. C. R. Hindenach. Further particulars may be had from the general secretary of the council, Tavistock House North, Tavistock Square, W.C.1.

### International Summer School

The British Social Hygiene Council are holding a summer school at the University of Lausanne from Aug 18 to Sept. 1 on the International and Cultural Relations of Social Biology. Further information may be had from the secretary of the council (Dept. M.2), Tavistock House North, Tavistock Square, London, W.C.1.

### Registration for National Insurance

With only six weeks left before the National Insurance scheme begins, fewer than half a million of the estimated 3 million self-employed and non-employed have applied for the National Insurance card which they are required to stamp after July 5. Application should be made by completing form C.F.6 (obtainable at any post office, local National Insurance office, or employment exchange), and sending it to the nearest employment exchange.

### World Congress on Physical Education

An International Congress on Physical Education, Recreation, and Rehabilitation is to be held in London from July 23 to 26. Delegates from over 50 countries are to be shown what is being done in this country to develop physical education in schools and colleges, physical recreation in after-school life, and reablement in industry and in the Services. Mr. George Tomlinson, the Minister of Education, will open the congress, and the speakers will include Sir Reginald Watson-Jones. The general secretary may be addressed at 6, Bedford Square, London, W.C.1.

The mantle of the famous Salernitan school has fallen on the shoulders of the Salernitan Society of Medicine and Surgery, constituted on Dec. 25, 1946, almost 130 years after the closing of the University of Salerno, which was founded in 1150. The transactions of its first year (1947), adorned with a copy of the city's seal bearing the legend CIVITAS HYPOCRATICA, has been published under the name of *Atti della Società Salernitana di Medicina e Chirurgia*.

### Appointments

HUNTER, J. L., M.B. Edin., D.P.H.: divisional M.O., West Cumberland.  
MACKENZIE, I. F., M.D. Edin., D.P.H., D.T.M. & H.: deputy M.O.H., Cumberland, and divisional M.O., East Cumberland.  
THOMSON, K. J., M.B. Edin., D.P.H.: M.O.H., Millom, and asst. M.O., Cumberland.

# THE LANCET

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No. 6510

LONDON: SATURDAY, JUNE 5, 1948

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## VITAMIN-C REQUIREMENT OF HUMAN ADULTS

### EXPERIMENTAL STUDY OF VITAMIN-C DEPRIVATION IN MAN

A PRELIMINARY REPORT BY THE VITAMIN C SUBCOMMITTEE OF THE ACCESSORY FOOD FACTORS COMMITTEE, MEDICAL RESEARCH COUNCIL\*

THERE is no agreement on the requirement of vitamin C in man. The League of Nations Technical Commission on Nutrition (1938) estimated the daily requirement of human adults at 30 mg., whereas the U.S. National Research Council's Committee on Food and Nutrition (1943) recommended an allowance of 75 mg. Some authorities put the daily requirement much below 30 mg. (see Zilva 1944). All these are rough estimates.

To obtain information more accurate than that available, on which an assessment of the requirement could be based, a trial was undertaken on human volunteers. It was planned to deprive one group of vitamin C and to give graded doses of the vitamin when signs of deficiency had developed. Other groups were to have supplements of vitamin C from the start as protective doses. The trial was carried out at the Sorby Research Institute, Sheffield, under the supervision of Prof. H. A. Krebs; it lasted from October, 1944, to February, 1946.

Nineteen men and one woman, aged 21-34, volunteered for the experiment. They lived a normal life without strenuous physical work. The basal diet was designed to be as low as possible in vitamin C but complete in every other respect. It was sufficiently varied to be reasonably acceptable. It included milk aerated at 60°C after addition of 10<sup>-6</sup> parts of copper sulphate, and a number of items, such as dehydrated meat, potatoes, and carrots, selected because they could be purchased in bulk, which were cooked in a special way to remove vitamin C. Plum jam was given to meet any possible criticism that factors included under the term "vitamin P" were omitted. A representative daily intake for a volunteer was: protein 104 g., fat 130 g., carbohydrate 340 g., calories 2900, calcium 1.2 g., iron 17.8 mg., vitamin A (exclusive of any carotene in the diet) 4800 I.U., vitamin D 900 I.U., aneurine 1.1 mg., riboflavine 2 mg., and nicotinamide 13 mg. From chemical analyses it was calculated that on the average a volunteer obtained not more than 1 mg. of vitamin C daily from the diet.

To obtain base-line data the experiment began with a preliminary period, in most cases of 6 weeks, on a complete diet including about 70 mg. of vitamin C daily. At the end of the period all the volunteers were given the basal deficient diet and divided into three groups. Ten had no supplements, seven received 10 mg. of vitamin C daily, and three received 70 mg. of vitamin C daily. The volunteers did not know to which group they belonged, nor did the physicians responsible for the clinical investigation. All the volunteers were daily given seven supplementary tablets of identical taste and appearance, some containing vitamin C, the others being dummies. The investigations, made on the volunteers at regular intervals, included general clinical examinations, chemical analyses of blood and urine, hæmatological examinations, capillary-fragility tests, capillaroscopy, measurements of capillary-filtration rate, radiography, electrocardiography, studies of fatigue, and studies of experimental wounds.

This paper represents the main results of the experiment in summary form; full details of the evidence on

\* The members of the vitamin-C subcommittee, R. A. Peters (chairman), K. H. Coward, H. A. Krebs, L. W. Mapson, L. G. Parsons, B. S. Platt, J. C. Spence, and J. R. P. O'Brien (secretary), formed part of a team which included B. Balfour, A. E. Barnes, W. Bartley, I. M. Frankau, G. A. Higgins, E. M. Hume, J. Pemberton, G. L. Roberts, H. Scarborough, H. R. Vickers, J. Waterlow, and W. J. Wellwood Ferguson.

which the conclusions are based, and full references to the literature, will be published elsewhere.

#### OCCURRENCE OF SIGNS OF DEFICIENCY

##### *In Volunteers Receiving no Supplement*

The clinical examinations, by inspection and physical methods, revealed no definite changes during the first 17 weeks of deprivation, beginning on Nov. 13, 1944. The first changes which retrospectively were recognised as significant were enlargement and keratosis of the hair follicles in one volunteer, particularly on the outer aspect of the upper arm. After 21 weeks six of the ten deprived volunteers had developed follicular changes, and after 26 weeks all had done so. In all of them except one the enlarged hair follicles eventually became hæmorrhagic. The various stages of development, observed by the skin microscope, were as follows:

The initial change was the plugging of a few follicles by horny material in which the hair was coiled or looped. The number of enlarged hair follicles increased in the ensuing weeks, the main areas affected being the upper arms, back, buttocks, backs of thighs, calves, and shins. A few weeks later the enlarged follicles turned red. Microscopically this redness presented itself as congestion and proliferation of the blood-vessels round the hair follicles; it gradually increased, and within another week or two the enlarged hair follicles became hæmorrhagic, the red colour turning dark purple and no longer disappearing on compression; with the microscope many red cells could be seen outside the vessels.

By May, 1945, after 26 weeks of deprivation, six of the ten volunteers, and 9 weeks later nine of the ten, had numerous hæmorrhagic follicles. In general it was on the legs that the follicles showed the greatest tendency to become hæmorrhagic. No subjective sensations accompanied the appearance of the hæmorrhages.

As the development of enlarged and hæmorrhagic hair follicles progressed, five of the ten deprived volunteers showed a very pronounced exacerbation of the acne present in a mild form at the start of the experiment. The papules became more numerous after about 22 weeks; they increased in size and later became bright red and eventually hæmorrhagic. The other five deprived volunteers who had no acne at the start remained free throughout the experiment.

The second change generally noted during the period of deprivation was in the gums. The earliest signs were tiny hæmorrhages in the tips of the interdental papillæ and swelling, seen first in May, 1945, after 26 weeks of deprivation. By the end of July, nine of the ten deprived volunteers had developed abnormalities of the gums. In two cases the changes were gross: the gums were purplish, much swollen, and spongy. In parts the tissue became necrotic, and there was some bleeding. In five others the gum changes, all located in the interdental papillæ, were less advanced but beyond question; they consisted of small hæmorrhages, swelling, and purplish discoloration. In two more of the men swelling and hæmorrhages developed but to a less extent, and their scorbutic origin was less certain; one of these subjects was edentulous. In general the teeth and gums were in good condition at the start of the experiment, but the two volunteers who developed the most severe gum changes showed evidence of gingivitis and parodontal disease at the start of the deprivation.

Another striking observation, in agreement with the old accounts of scurvy, was recorded from June, 1945, onwards in six of the ten deprived volunteers, affecting the behaviour of the scars of the experimental wounds (see below). Scars of wounds made between February and May, whose healing had proceeded normally, became red and livid. New wounds made at the stage of pronounced hæmorrhagic scurvy showed a reduced tendency to heal.

Some important abnormalities were observed in single cases. One man developed effusions into both knee-joints and ecchymoses of the leg in June, 1945, after a

long walk. Another was taken ill in July, 1945, nineteen hours after heavy physical exercise. He had severe pain in the lower sternal region, and he became dyspnoic and cyanosed. The pulse was rapid and the blood-pressure low. The clinical picture was that of an acute cardiac emergency. He was immediately admitted to hospital and dosed with vitamin C. The lower sternal pain, which at first had increased in intensity, passed off after nine hours. The electrocardiogram showed high ST levels in leads I and II. A radiogram of the chest showed no abnormality. Eighteen days later another deprived volunteer complained of a sudden constrictive pain in the chest. Physical examination revealed a systolic murmur which had not been heard before, and the electrocardiogram showed a partial heart-block, the P-R interval being 0.28 sec. Before the experiment the electrocardiogram had been normal with a P-R interval of 0.20 sec. It was thought necessary to treat this volunteer immediately with large doses of vitamin C. The chest pain and the systolic murmur disappeared within twenty-four hours, but during the following months the P-R interval showed variable periods between 0.20 and 0.28 sec., depending on posture, breathing, administration of drugs, and other factors. These subsequent electrocardiographic observations raised the question whether the heart-block in this case had any connexion with the deficient diet, especially in view of recent observations on Service personnel (see Manning and Stewart 1945, Hall et al. 1942, Holmes and Weill 1945).

A modification of the "agility" test (Frankau 1943), which had been used to demonstrate the acceleration of coördinated muscular effort in human subjects given nicotinamide, was used to measure objectively the incidence of fatigue in the volunteers. Interruption in the consecutive sequence of the tests, caused by the infliction of the experimental wounds, interfered seriously with the manifestation of any clear-cut trends. In all three groups, however, accuracy of coördinated movement was unaltered throughout the trial; in the totally deprived group there appeared first a variability, and later a small but significant increase, in the time taken to perform the test. Both these observations indicate increased fatigue. On the pulse-rate the effect of the "all-out" effort demanded by the agility test was to cause a rise followed by a fall in the 3 min. immediately after the test, both of which were significantly greater in the group receiving 70 mg. than in the groups receiving 10 mg. or none.

There was no evidence in any of the volunteers of serious psychiatric disturbances connected with the deprivation of vitamin C; neither the character of the diet, with the restrictions entailed by adhering to it, nor the somewhat abnormal conditions of life proved unduly irritating or difficult. The appearance of clinical signs of scurvy was followed by a wave of instability, introspection, and curiosity about the composition of the groups. This phase was only transitory and was followed by no psychiatric disturbance. An "attention" test was introduced as an objective check on the alleged occurrence of apathy in scorbutic subjects. No evidence of deterioration in performance was found.

Measurements of capillary-filtration rate were made by a method modified from that of Landis and Gibbon (1933); no significant changes were found in the deficient group as the experiment progressed.

Some other negative findings are worth recording. There was no significant change in body-weight, no increased incidence of infection, and no change in the appearance of the capillaries of the nail bed and of the conjunctivæ. Dark-adaptation, as measured by the Wald-Steven-Bartley apparatus and by rod scotometry, remained normal. Subjectively there were no complaints of general pains or weakness.

Special steps were taken to look for hæmorrhages elsewhere than in the skin and mouth but none were

found. The urine never contained red cells. There was no occult blood in the stools of the two subjects who were tested at the height of their scorbutic state. There was no epistaxis, and no conjunctival hæmorrhages were seen on slit-lamp examination.

The capillary-resistance tests of Hess (1920) and of Göthlin (Falk et al. 1932) showed no consistent trends throughout the period of deprivation. Other capillary tests, made by Dr. Harold Scarborough by his special method, will be described in a separate publication.

Hæmoglobin concentration, red-cell count, total and differential leucocyte-counts, platelet-count, and bleeding-time showed no significant changes during the course of the depletion. The results of chemical tests on the blood in deprived and in non-deprived subjects are considered below.

#### *In Volunteers Receiving 10 mg. of Vitamin C Daily*

In the seven volunteers receiving a supplement of 10 mg. of vitamin C daily no abnormalities were noted during the first 160 days of the experimental period. It was then decided that four of the volunteers should continue with the 10 mg. supplement and three of them be deprived of it, the object being to ascertain whether signs of deficiency would develop quickly on withdrawal of the supplement.

Three of the four volunteers to receive 10 mg. continued for another 264 days, and one abandoned the experiment after another 92 days. No abnormalities were recorded. Wound healing, as judged by the appearance of the excision scar on inspection, proceeded normally, and, in contrast with the deprived group, there were no hæmorrhages into the scar tissue.

The second group of three volunteers had no supplement for 71 days, broken in one case by a 26-day period on a supplement of 10 mg. Towards the end of the period of 71 days two of these volunteers showed a few keratotic, but not hæmorrhagic, hair follicles; this abnormality disappeared when large doses of vitamin C were given, and it was probably connected with the deficient diet. The third man of this group showed no changes at the end of 71 days. At this stage of the experiment (July, 1945) two totally deprived volunteers showed the cardiac disturbances already mentioned. It was therefore decided to restore the supplement to the extent of 5 mg. daily. On this dose the three men continued for another 125 days. Two of them showed a slight increase in the number of keratotic hair follicles but no other clinical changes.

#### *In Volunteers Receiving 70 mg. of Vitamin C Daily*

This group of three volunteers served as positive controls for 300, 326, and 331 days. No changes worthy of note were recorded.

#### EFFECTS OF VARIOUS DOSES ON DEPRIVED SUBJECTS AND ON THOSE ALREADY GIVEN SUPPLEMENTS

Three of the ten volunteers who developed scurvy on the unsupplemented diet were lost for trials with graded doses, because sudden emergencies demanded their immediate treatment with large doses of the vitamin. Two of these three, as already mentioned, were dosed because they had signs of acute cardiac complications. A third had shortness of breath and pain in the chest in May, 1945. Radiography revealed spondylitis and a paravertebral abscess, and spinal tuberculosis was diagnosed. A review of earlier radiograms indicated that this man's spine was not healthy at the beginning of the experiment. At the time when he developed symptoms his skin and gums showed the most advanced scorbutic changes seen in the volunteers. In view of his serious state he was at once given a large dose of vitamin C. The three volunteers dosed with large amounts showed striking improvement within a few days.

The remaining seven all showed unequivocal signs of scurvy in multiple skin hæmorrhages and gum lesions.

It was desired to select the minimum dose likely to produce a cure within a reasonable time but to aim too low rather than too high, since the dose could be increased later if necessary. A daily dose of 10 mg. was chosen and given to six of the seven volunteers. The seventh received 20 mg. because this volunteer was not available for long.

**Result of Dosing with 10 mg. of Vitamin C Daily**

The response to the dose of 10 mg. followed the same pattern in all six cases. Within a week hæmorrhages into the perifollicular region ceased, and within 1 or 2 weeks the older hæmorrhages began to lose their dark purple colour and gradually faded. Within a month the hair in most of the follicles uncoiled, lifting out the plug. The dilatation and congestion of the capillaries round the hair follicles disappeared, and within 7-9 weeks the skin appeared normal except for a slight brown pigmentation at the site of the former hæmorrhages.

The liability to hæmorrhage in the wound tissue and the failure of the wounds to heal disappeared as the follicular eruptions regressed. The wound hæmorrhages disappeared within 2 months, the original blue and purple colour gradually giving way to a pure red, pink, and finally pale brown, and changes in the appearance of the wounds indicated improved healing.

The acneiform papules likewise regressed to the pre-experimental state, though in most cases somewhat more slowly than the other skin signs. The initial state was regained within 10-18 weeks.

The gum lesions did not respond to dosing as promptly as did the follicular skin lesions. When improvement began, the first sign was a change from livid blue to bright red, followed by the normal pink. Slowly the swelling decreased and the consistency of the gums improved, restoration being complete within 10-14 weeks.

**Result of Dosing with 20 mg. of Vitamin C Daily**

One volunteer, as already stated, received 20 mg. of vitamin C daily at the end of the depletion period. Both the skin and gum lesions were slight, consisting of a limited number of hæmorrhages. Complete restoration was achieved within 3 weeks.

Five of the six volunteers who had been treated with 10 mg. of vitamin C daily, and cured of clinical scurvy, received subsequently a daily dose of 20 mg. of vitamin C for 47-92 days. The appearance of skin, gums, and wounds showed no further changes.

**VITAMIN-C CONTENT OF THE BLOOD**

Vitamin-C determinations were made on blood taken from the subjects in a fasting condition. Vitamin C in the plasma and in the white cells of the blood (Butler and Cushman 1940) was estimated by the dye titration method at weekly or fortnightly intervals throughout the trial.

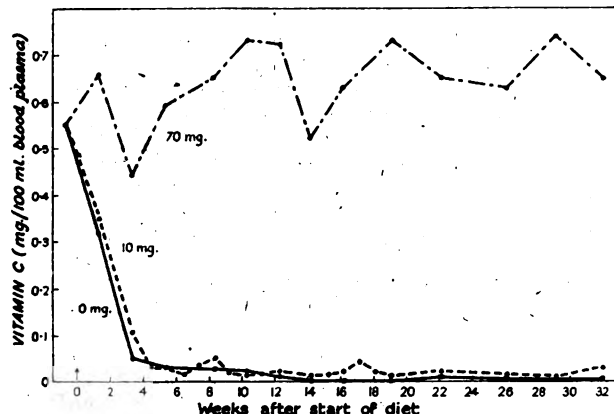


Fig. 1.—Average vitamin-C content of blood plasma, estimated with dichlorophenolindophenol, of the groups of volunteers receiving daily 70, 10, or 0 mg. of ascorbic acid as supplement to the basal diet, which contained about 1 mg.

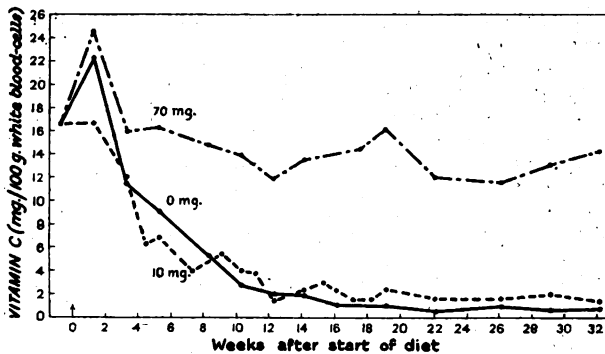


Fig. 2.—Average vitamin-C content of white blood-cells, estimated with dichlorophenolindophenol, of the groups of volunteers receiving daily 70, 10, or 0 mg. of ascorbic acid as supplement to the basal diet, which contained about 1 mg.

The average values for the concentration of vitamin C in the plasma and white blood-cells are shown in figs. 1 and 2.

**Vitamin-C Content of Plasma.**—The initial average value for all the volunteers, at the end of the 6-week preliminary period with an intake of about 70 mg. daily, was 0.55 mg. per 100 ml. of plasma, and this value was maintained throughout the period of the experiment by those receiving 70 mg. daily. In the totally deprived volunteers the average value was 0.03 mg. per 100 ml. after 37 days, and remained between 0 and 0.03 mg. per 100 ml. for the rest of the deprivation period. In the volunteers receiving a supplement of 10 mg. of vitamin C daily the average value was 0.03 mg. after 31 days and fluctuated between 0.01 and 0.05 mg. per 100 ml. during the experimental period. Owing to the shortcomings of the analytical method no significance can be attached to the slight differences in the concentration of vitamin C below 0.05 mg. per 100 ml. of plasma.

**Vitamin-C Content of White Blood-cells.**—The initial average value of the white-cell concentration for all volunteers was 16.6 mg. per 100 g., and was maintained at this level throughout in those receiving 70 mg. of vitamin C daily. In the totally deprived group it fell to 1 mg. per 100 g. in 113 days, and remained below this value for the remainder of the period. For concentrations below 2 mg. per 100 g. of white cells the method is not very accurate, and differences between 0 and 2 mg. per 100 g. are of doubtful significance. The average concentration of the vitamin C in the white cells of the volunteers receiving a supplement of 10 mg. of vitamin C daily attained a value between 1.5 and 3 mg. per 100 g. in 86 days, and from the 109th day onwards remained roughly 1 mg. per 100 g. above the figure of the deficient group.

**Relation between Clinical Signs and Vitamin-C Content of Blood.**—About 100 days elapsed between the virtual disappearance of vitamin C from the plasma and the first clinical signs of scurvy. On the other hand, the concentration of vitamin C in the white cells reached its lowest value only 3-6 weeks before clinical scurvy appeared.

**Effect of Dosing with Vitamin C on Blood Concentration.**—When the deficient volunteers were dosed with 10 mg. of vitamin C daily, the concentration of the vitamin in the plasma and white cells showed a small but distinct rise towards the end of a dosing period of 101-157 days. The average concentration of the plasma rose from 0.016 to 0.06 mg. per 100 ml., and that of the white cells from below 1 mg. to 2.7 mg. per 100 g. Increasing the dose to 20 mg. daily produced no change in the vitamin-C concentration of the plasma, and a slight rise in that of the white cells to 3.6 mg. per 100 g.

**Relation between Blood Concentration and Vitamin-C Intake.**—It is remarkable that an intake of 10 mg. daily above the basal level (estimated at about 1 mg.) hardly affected the concentration of the vitamin in plasma.

and white cells. There seemed to be a significant difference between the average value for the deficient group and the average value for the group receiving a supplement of 10 mg. of vitamin C daily, but it is doubtful whether a single blood determination could differentiate the concentration of vitamin C in plasma or white cells of persons on a prolonged intake of about 1 mg., which in nine cases out of ten produced scorbutic hæmorrhages after 6-8 months, from that of persons on an intake of about 11 mg., which over a period of 14 months prevented the appearance of the clinical signs of scurvy.

To obtain further data correlating the vitamin-C intake with its concentration in the plasma and white blood-cells, two volunteers who had received 70 mg. of vitamin C daily for 326 and 331 days were given 50 mg. daily for 66 and 61 days. Towards the end of these periods the vitamin-C concentration in the plasma had fallen from 0.64 and 0.52 mg. to 0.32 and 0.29 mg. per 100 ml., and in the white cells from 12 and 10 mg. to 9.6 and 7.6 mg. per 100 g.

*Synopsis of Data on Vitamin-C Content of Blood in Relation to Vitamin-C Intake.*—The accompanying table summarises the data on the concentration of vitamin C in the plasma and in the white-cell layer at different levels of intake (see also Thysell 1939).

#### VARIOUS OTHER BLOOD EXAMINATIONS

The following chemical tests on the blood plasma gave no significant variations from normal values, relative to the vitamin-C intake: plasma-protein, albumin and globulin ratio, urea, and phosphatase.

#### EXPERIMENTS ON WOUND REPAIR

Experiments were undertaken to extend the work of Lund and Crandon (1941), Pijoan and Lozner (1944), and Farmer (1944) on wound healing in vitamin-C deficiency in man.

*Procedure.*—Preliminary tests indicated the suitability of a linear incision 3 cm. long and a stab wound 1 cm. long, both on the outer aspect of the upper thigh. The linear incisions were made to the depth of the fascia lata and were sutured with three gut stitches, removed after 4 days, and covered with a pad, which was removed after 10 or 21 days, when a swab was taken to test sterility and the scar was excised. The gap was sutured and left to heal. The excised material was cut into several pieces to be examined histologically, and for breaking-strain. The stab wounds were made by pushing a scalpel 1 cm. wide to a depth of 1 cm. The wound was covered with 'Elastoplast' without suture and was excised for histological examination after 10 or 21 days. In all, 72 wounds were made on 19 volunteers.

*Appearance of Wounds on Inspection.*—Reference to the appearance of the wound scars on inspection has already been made. These statements refer to the wounds left after excision of the first incision or stab. They do not refer to the scars, whose physical and histological properties are described below. Since the latter were covered with a dressing throughout they could not be observed; when they were seen at the time of excision no abnormality was observed except in one instance which is noted below. In the groups receiving a 10 or a 70 mg. supplement no abnormalities were ever seen in the excision wounds, but in the deprived group at the height of the depletion the excision wounds had a reduced tendency to heal, and older wounds which had begun to heal normally showed hæmorrhages into the scar and surrounding tissues.

*Histological Observations.*—The main histological criteria for assessing wound repair were union of epidermis, quantity of collagen, quantity of reticulin, maturity of fibroblasts, and appearance of blood-vessels. According to Wolbach (1933) "wounds on completely depleted scorbutic guineapigs show adequate fibroblastic proliferation but no reticulin formation." On low doses of ascorbic acid, however, Danielli et al. (1945) found profuse reticulin formation but no maturation to collagen.

VITAMIN-C CONTENT OF PLASMA AND WHITE CELLS IN RELATION TO VITAMIN-C INTAKE

Vitamin-C intake additional to about 1 mg. in basal diet (mg. daily)	No. of subjects	Duration of dose (days)	Average vitamin-C concentration in—	
			Plasma (mg./100 ml.)	White cells (mg./100 g.)
0	10	205-269	<0.03	<1.0
5	3	125	<0.05	2.0
10	6	101-157	<0.10	2.7
20	5	47-92	<0.10	3.6
50	2	61-66	0.31	8.6
70	3	300-336	0.55	10.0
About 600	15	8-11	1.02	17.0

The data refer to average values found towards the end of a period on the dose specified in the first column. The figures recorded in the bottom line of the table are the averages of the highest values observed in each of the 15 volunteers who were given a "saturation" test at the end of the experiment, when they received a dose of 10 mg. of vitamin C per kg. of body-weight for 8-11 days. All data were obtained in the fasting state.

According to unpublished work of Penney and Balfour on guineapig wounds there may, in complete deficiency, be also decreased vascular and fibroblastic proliferation.

It was found that 10 days was too short a period to show up major differences in healing, especially in collagen formation, and after preliminary tests this period was abandoned in favour of one of 21 days. The findings in the linear and stab wounds excised after 21 days resembled one another sufficiently to justify their being considered together. To classify the observations, the wound responses were placed in two main grades: (1) normal responses; and (2) gross abnormalities of the type seen in wounds made on scorbutic guineapigs. Wounds showing macroscopic hæmorrhages or infection were omitted from the series.

All wounds from subjects belonging to the groups receiving either 70 or 10 mg. of vitamin C came within the first or normal grade, except those from one man whose skin showed definite endarteritis and should therefore be excluded as abnormal. In the group of totally depleted subjects seven 21-day wounds were made after 5-8 months' deficiency. Of the seven wounds four showed scorbutic lesions and three showed none; one of the wounds showed good healing though it was made when clinical signs of scurvy were well developed.

Six further wounds on these subjects, made after they had been "saturated" with vitamin C, showed considerable variation. In three cases healing was of the first or normal grade, but in the other three it was poor and an unusually large amount of degenerated collagen was present at the side of the wound track.

*Breaking-strain.*—The data discussed in this paragraph all refer to wounds excised after 21 days. There was no difference as regards breaking-strain of the wounds between the groups supplemented with 10 and 70 mg. of vitamin C daily; values between 12 and 31 kg. per sq. cm. were recorded for each. At the height of depletion three acceptable readings were obtained from deficient subjects, all of which gave lower values (6.0-8.8 kg. per sq. cm.) than those of the supplemented groups (12-31 kg. per sq. cm.). In three volunteers the breaking-strain was still low (7.2-10.0 kg. per sq. cm.) after saturation. The correlation between low tensile strength and histological evidence of poor healing was not close. Of nine wounds made either before or after saturation, in which the breaking-strain might be considered low (less than 11 kg. per sq. cm.), healing was histologically satisfactory in four. The low tensile strength in these cases may have been due to non-scorbutic abnormalities whose cause and nature are not clear.

*Conclusions.*—Judged by the criteria available, a dose of 10 mg. of vitamin C daily was sufficient to maintain the normal healing power of the skin up to 11 months. In the non-supplemented group severe defects in wound healing occurred similar to those recorded in scorbutic guineapigs. These defects were encountered only when, and not before, clinical signs of scurvy had appeared, i.e., after 6 months' depletion.

#### DISCUSSION

##### *Course and Signs of Depletion*

No attempt is made here to discuss the literature on scurvy. The course of the development of scurvy was fairly uniform in the ten volunteers and very similar to that in the case described by Crandon et al. (1940). The general course was as follows: for about 17 weeks no clinical signs; after 17–21 weeks the first sign was hyperkeratosis of the hair follicles (see Wiltshire 1919); after 26–34 weeks perifollicular hæmorrhages; and after 30–38 weeks swelling and hæmorrhages of the gums. Exacerbation of acne, not apparently hitherto recognised as a sign of scurvy, began after 22 weeks.

Like all the other *single* clinical signs of scurvy, neither hyperkeratosis nor congestion of the hair follicles is a specific sign, and the occurrence or gradual development of either of them in a person does not necessarily indicate lack of vitamin C. They occur in many people "saturated" with vitamin C. Deficiency in this vitamin is only one of a variety of causes which can evoke them. In the present trial the appearance and disappearance of the skin changes strictly reflected the intake of vitamin C, and this proved beyond doubt that they were the early stages of the typical hæmorrhagic spots of scurvy.

The gum lesions appeared always after the skin lesions. Though this may not always be true of scurvy, it might nevertheless be a useful diagnostic pointer in deciding on the cause of gum lesions of doubtful origin.

Many signs listed as scorbutic in the classical description of the disease—e.g., pallor, dryness of the skin, anæmia, and night-blindness—were not observed. It is probable that classical scurvy was often a multiple deficiency.

##### *Intake in Relation to Level in Plasma and White Cells*

So long as the diet contained no more than 20 mg. of vitamin C daily, the average plasma level remained below 0.10 mg. per 100 ml. At higher levels of intake the concentration of the vitamin in the plasma rose. A concentration of about 0.30 mg. per 100 ml. corresponded to an intake of 50 mg. daily, and of about 0.55 mg. per 100 ml. to an intake of 70 mg. daily (compare Thyssel 1939). When the vitamin was withdrawn from the diet, the plasma level began to fall almost at once. In contrast, the vitamin-C level in the white cells fell much more slowly on the withdrawal of the vitamin. Nevertheless, as the table shows, the level in the white cells did to some extent reflect the dietary intake. In general the level in the white cells was about 25 times that in the plasma.

For assessing the state of vitamin-C nutrition it appears that, in a fasting person, a plasma value below 0.10 mg. per 100 ml. indicates an average daily intake in the region of 20 mg. If, therefore, in a doubtful case of scurvy the plasma level is 0.10 mg. per 100 ml. or more, the existence of scurvy is very improbable, since the intake of 20 mg. daily, necessary to maintain a plasma level of 0.10 mg. per 100 ml., was found to be an adequate curative dose. On the other hand, a plasma level of below 0.10 mg. per 100 ml., though an accompaniment of scurvy, is not proof of scurvy or of imminent scurvy. At present, therefore, the main clinical use of the plasma value for vitamin C is to exclude rather than to confirm the diagnosis, and this is likely to remain so as long as the technique does not distinguish more accurately than at present between levels of 0 and 0.10 mg. per 100 ml.

The determination of vitamin C in the white cells is of somewhat greater diagnostic value, because it shows more definite differences between the intake levels of 20 mg., 10 mg., and less than 5 mg. daily. A concentration below 2 mg. per 100 g., especially when confirmed on repeated analyses, indicates severe depletion and supports the diagnosis of scurvy. Eventually, with some further improvement in the technique, it may be possible to assess the dietary intake from the result of vitamin-C determinations in the white cells.

##### *Requirement of Vitamin C*

The term requirement is here used to mean the amount of a dietary essential which must be eaten to maintain full health. In using the facts obtained in the present trial for an assessment of the human requirement the diet and the mode of life of the volunteer must be kept in mind. The main facts relevant to the assessment of the requirement are as follows:

- (1) A supplement of 10 mg. cured clinical scurvy in all six cases examined.
- (2) A supplement of 10 mg. protected seven volunteers throughout the period of observation, which, in the case of three of them, extended to 424 days.
- (3) When a 10 mg. supplement was withdrawn from three volunteers after 160 days and was followed by a period of 195 days during which the intake varied slightly, but for which the average intake was 3.2, 3.2, and 4.5 mg. of vitamin C daily, no definite clinical signs of scurvy—i.e., no hæmorrhages—appeared.

These facts suggest that in the group under test the "minimal protective dose" of vitamin C, as measured by the criteria of the presence of scurvy, was in the region of, perhaps somewhat below, 10 mg. daily. On the other hand, the tests of physical fatigue, though not producing conclusive results, leave some doubt whether 10 mg. was an optimal dose, since the statistical analysis revealed small differences in favour of the group receiving 70 mg. against the group receiving 10 mg. It would not be unexpected that the prevention and even cure of clinical scurvy should require a smaller dose than the attainment of maximal efficiency under conditions of stress such as those produced by the "agility" test.

Distinct from the minimal protective dose for a particular group of people, in this case a few normal young adults leading a life without strenuous physical work, is "the larger figure which shall cover the requirement of normal adults with their own inherent variability enhanced by the variety of their activities and environment and ensure for them the margin of protection at which it is decided to aim" (Hume and Krebs 1948). To satisfy these ill-defined additional needs and to allow a margin of safety it does not therefore seem too generous to treble the minimal protective dose of 10 mg., which prevents clinical scurvy, and thereby confirm the figure of 30 mg. of vitamin C daily recommended by the League of Nations Technical Commission on Nutrition (1938) for the requirement of a normal human adult.

Any assessment is, at the present state of knowledge, a matter of judgment and must be regarded as provisional. The present assessment has a firmer basis than previous estimates in that it rests on the determination of the minimal protective dose for a group of human beings. The new estimate is considerably below the allowance of 75 mg. recommended by the U.S. National Research Council's Committee on Food and Nutrition (1943), which is essentially the amount necessary to maintain "saturation"; but, so long as there is no evidence to support the view that an intake of more than 30 mg. daily has beneficial effects, there is no basis for recommending an intake greater than that amount.

When this figure is used, for whatever purpose, it should be borne in mind how it was assessed. It is obvious that intakes much below the recommended figure, which are reflected in a plasma concentration of vitamin C not

distinguishable from a scorbutic one, are not necessarily detrimental to health.

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## RESIDUAL SYMPTOMS IN GRAVES'S DISEASE AFTER THYROIDECTOMY

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PATIENTS who have undergone thyroidectomy for Graves's disease (primary thyrotoxicosis) not infrequently retain symptoms such as nervousness, palpitations, sweating, tremor, and lability of the pulse-rate on emotion or exertion, besides some of the eye signs of thyrotoxicosis. Joll (1932) admitted the frequency of these postoperative symptoms: "If complete and permanent disappearance of all signs and symptoms of the disease is to be the necessary criterion for success (of thyroidectomy) comparatively few patients would pass the test." The symptoms are often loosely termed "residual signs of toxicity," but their origin has never been clearly demonstrated, though various causes have been suggested.

Warthin (1928) and Moschcowitz (1930) postulated a "Graves's constitution," or background of nervous instability to the disease, which could not be eradicated by thyroidectomy and persisted as a cause of postoperative symptoms. Rasmussen (1937) observed similar symptoms which remained in cases of Graves's disease after surgical, X-ray, or medical treatment. He termed them "the psychoneurotic syndrome of Basedow's disease" and considered that they were acquired as part of the disease. Rundle (1941) attributed postoperative symptoms to a permanent canalisation of their responsible nervous pathways during the active course of Graves's disease. Finally, Moschcowitz and Bernstein (1944) suggested that neurocirculatory asthenia (effort syndrome or cardiac neurosis) not only provided the background of Graves's disease but also remained to cause symptoms after thyroidectomy.

Thus, though the published work provided nothing stronger than conjectures about the origin of the postoperative symptoms, it did at least offer alternatives to residual thyrotoxicosis as a cause. It appeared, therefore, that a careful analysis of the postoperative symptoms in cases of Graves's disease, particularly as regards their time-relationship with the course of the disease and treatment, might enable the various suggestions to be tested. As a working hypothesis, it seemed that the postoperative symptoms might have the following origins:

(1) *Constitutional*.—Symptoms of this kind would have been present before the onset of Graves's disease and would have persisted after thyroidectomy.

(2) *Residua of Graves's Disease*.—These would have arisen during the active course of the disease and would have persisted afterwards.

(3) *Effect on the Patient of having had Graves's Disease and Thyroidectomy*.—These symptoms would have arisen after thyroidectomy.

(4) *Causes Unconnected with Graves's Disease or Thyroidectomy*.—Symptoms of this kind might have existed before or arisen after thyroidectomy but would be unconnected with it or with constitutional symptoms.

#### METHODS AND MATERIAL

It was obviously essential to examine patients whose postoperative thyroid function was normal, to avoid the hazard of symptoms caused by hypothyroidism or residual thyrotoxicosis. Accordingly 33 patients were selected in whom thyroid function appeared to be normal, as judged clinically and by basal metabolism estimations when possible. All patients had undergone thyroidectomy for Graves's disease (primary thyrotoxicosis) confirmed histologically. At follow-up the intervals after thyroidectomy ranged from two and a half to ten years. Of the 33 patients, 22 were women. The average age of the women at thyroidectomy was 30 and of the men 38. Graves's disease had been mild in 5 cases, moderate in 13, and severe in 15.

Detailed inquiry was made at examination into any remaining symptoms, and the time of their onset was determined. It was thus possible to assign them to one or other of the categories set out above.

#### INCIDENCE OF SYMPTOMS

Of the 33 cases only 2 (1 mild and 1 severe) had no residual symptoms at all, a striking confirmation of Joll's dictum. The remaining 31 cases had the following symptoms: nervousness (18), eye signs (16), palpitations (14), dyspnoea on exertion (13), lassitude (12), tremor (11), sweating or dislike of hot weather (10), disturbed sleep (7), headaches (5), phobias (4), left submammary pain (3), and diarrhoea (1). All these symptoms can exist in active Graves's disease, and any of them in combination with persistent eye signs may give an erroneous impression of residual thyrotoxicosis after thyroidectomy. In this inquiry, apart from the eye signs, which alone constituted the symptoms in category (2), the symptoms were distributed among the other three categories without any discernible pattern. The following analysis of symptoms in the various categories simply aims at showing how they arose and does not attempt to estimate their frequency.

##### (1) *Constitutional Symptoms*

In the analysis of constitutional symptoms inquiry was first made into the physical state and personality of the 33 patients before the onset of Graves's disease. They fell into three broad groups:

(a) *Normal*.—13 cases. These were apparently normal and stable persons, of whom 7 had had no symptoms before the onset of Graves's disease, and 6 had had "symptoms" which were scarcely pathological, such as lifelong dislike of hot weather, mild phobias of crowds or of confined places, and occasional distress on exertion.

(b) *Overconscientious*.—8 cases. These patients were characterised by lifelong restlessness and inability to relax physically or mentally. They worried unduly and habitually overworked but always completed their tasks. Their symptoms included restlessness, lassitude, apprehensions, and disturbed sleep.

(c) *Emotionally Unstable*.—12 cases. These patients had always been shy and nervous, volatile or irritable, and subject to palpitations, tremor, and flushing on emotion or excitement.

TABLE I—RELATIONSHIP OF PERSONALITY TO SEVERITY OF SUBSEQUENT GRAVES'S DISEASE

Personality	Degree of Graves's disease		Total
	Mild or Moderate	Severe	
Normal .. .. .	6	7	13
Overconscientious .. .	5	3	8
Emotionally unstable ..	7	5	12
Total ..	18	15	33

Table I shows that personality had no influence on the severity of subsequent Graves's disease; for about half the patients of each type had mild or moderate, and half had severe Graves's disease. Of the 33 patients, 23 had had constitutional symptoms before the onset of Graves's disease and 10 had had none; 6 of the 13 normals, 5 of the 8 overconscientious, and all 12 of the emotionally unstable had had constitutional symptoms.

Table II shows the nature of the constitutional symptoms in patients of each personality type.

In all cases constitutional symptoms had been aggravated during the course of Graves's disease but reverted to their previous intensity after thyroidectomy, except that nervousness and dislike of hot weather were relieved in 2 cases.

It was concluded that Graves's disease could arise alike in normal people and in those who were overconscientious or emotionally unstable. There was no evidence of any common or constant underlying personality or of neurocirculatory asthenia. The severity of Graves's disease was apparently independent of the personality.

(2) *Residua of Graves's Disease*

The only postoperative symptoms which had undoubtedly arisen as part of Graves's disease were the eye signs, which had persisted in 16 of the 33 cases. Exophthalmos, lid-retraction, lagging of the lids on looking downwards, and oedema of the eyelids were noted alone or in combination. Of the 16 cases with eye signs, 7 had been severe cases of Graves's disease, 6 moderate, and 3 mild; 6 patients had been of normal type, 5 overconscientious, and 5 emotionally unstable. It thus appeared that the persistence of eye signs after thyroidectomy was unrelated either to the severity of Graves's disease or to the constitutional type of the patient.

After exclusion of symptoms due to constitutional causes and the residual eye signs of Graves's disease there still remained symptoms, which included nervousness, palpitations, dyspnoea on exertion, tremor, sweats, headaches, functional cough and aphonia, and disturbed sleep, which fell into categories 3 and 4.

(3) *Effects of having Graves's Disease and Thyroidectomy*

The simple effect of having had any illness followed by an operation is not sufficiently taken into account in the assessment of the results of the operation. If convalescence has not been smooth, the likelihood of postoperative anxiety or of invalidism is increased, particularly in nervous or unstable persons. The following brief case-histories are illustrative:

**Case 1.**—An emotionally unstable woman, aged 26, underwent thyroidectomy for Graves's disease in January, 1942. The postoperative course was uneventful, and she left

hospital three weeks later. She attended continuously as an outpatient, however, until follow-up in February, 1946, by which time she had developed a typical cardiac neurosis with left submammary pain, cold moist hands, giddiness and palpitations on exertion, and fear of effort. The basal metabolic rate (B.M.R.) was +8%. She had become convinced that Graves's disease had affected her heart, she could not forget "her operation," and had become resigned to being an invalid.

**Case 2.**—An emotionally normal married woman, aged 27, had thyroidectomy for severe Graves's disease in October, 1941. Preoperative preparation had been interrupted by a streptococcal sore throat and laryngitis. Recovery from the operation was smooth. Six months later, functional aphonia appeared and recurred intermittently until follow-up in March, 1946. She attributed the aphonia to the laryngitis and thyroidectomy, and also experienced lassitude and disturbed sleep. She was constantly afraid that Graves's disease would return, and her symptoms were those of an anxiety state.

**Case 3.**—An emotionally unstable married woman had been brought up as a child by an aunt because her mother had died of pulmonary tuberculosis. She had experienced night terrors with severe palpitations as a child, and had been repeatedly examined for possible pulmonary tuberculosis, with the result that a functional cough developed on emotion or upset. She developed severe Graves's disease but refused thyroidectomy until August, 1941. The wound became infected, and she was ultimately readmitted to hospital for wound toilet. At follow-up in April, 1946, she said that she "had never really got over the operation." The functional cough continued, and occasional aphonia was superadded; palpitations were also troublesome. Despite the cough and palpitations since early childhood, the patient now substituted the operation as a cause of the former, and Graves's disease as a cause of the latter. Probably she never realised that pulmonary neurosis was responsible for her cough and now thyroidectomy provided her with a satisfactory reason.

**Case 4.**—An emotionally normal married woman, aged 51, became rather obese before the onset of Graves's disease and accordingly experienced some dyspnoea on exertion. After thyroidectomy in November, 1942, the wound became infected and protracted treatment by drainage, X-ray therapy, and re-excision was necessary. She attended hospital continuously after ultimate healing until follow-up in February, 1946. During that time her weight returned to 11 st. 10 lb., at which it had stood before the onset of Graves's disease. Her dyspnoea on exertion, tremor, lassitude, and palpitations also returned. She had developed an anxiety state from the fear that her

TABLE II—CONSTITUTIONAL SYMPTOMS IN PERSONALITY TYPES

Symptom	Normal	Overconscientious	Emotionally unstable	Total
Nervousness or worrying ..	0	6	9	15
Palpitations ..	2	0	5	7
Sweating or dislike of hot weather ..	3	3	4	10
Tremor .. .. .	0	1	4	5
Lassitude .. ..	1	0	1	2
Dyspnoea .. ..	1	0	1	2
Phobias .. .. .	2	0	2	4

operation would break down again or Graves's disease recur. Her constant visits to hospital were made to obtain reassurance, which was not always forthcoming, and if anything the visits probably increased her anxiety.

These cases show how new symptoms arose after thyroidectomy, and how old ones were perpetuated because the patient misinterpreted them. Much of this anxiety and invalidism might have been prevented by simple reassurance and explanation.

*Causes Unconnected with Graves's Disease or Thyroidectomy*

Some symptoms were clearly due to extraneous causes which had arisen after Graves's disease and thyroidectomy. They might well be thought irrelevant in a follow-up of the results of thyroidectomy but for the fact that the same symptoms arise in Graves's disease. A bald statement of residual symptoms after thyroidectomy,

such as is obtained by a postal questionnaire, may be entirely misleading, as the following case-histories show:

**Case 5.**—A soldier, aged 26, of emotionally unstable type, underwent thyroidectomy for severe Graves's disease in May, 1943. He had experienced palpitations during the course of Graves's disease only on one occasion, while swimming. He remained quite well after thyroidectomy and discharge from the Army until December, 1944, when he cycled a long distance in the snow and was compelled to stop by extreme fatigue and severe palpitations. On reaching home he had a high temperature and stayed in bed for four days with influenza. It seems clear that his symptoms while cycling were due to the onset of influenza, but this man was badly frightened and at once convinced that his heart had been damaged by Graves's disease. He developed the classical symptoms of cardiac neurosis, including palpitations and dyspnoea on exertion, left submammary pain, lassitude, and fear of effort. By a curious and unfortunate choice he married a lady who, as well as her sister, had Graves's disease, and he had ample opportunity for discussion about the heart in that condition.

This case illustrates how the misinterpretation of symptoms can quickly cause a cardiac neurosis whose symptoms might mislead an observer in a follow-up study of Graves's disease.

**Cases 6 and 7.**—Two women, aged 49 and 54, complained at follow-up of palpitations, dyspnoea, sweating, and lassitude. Both had gained weight since thyroidectomy, but neither showed signs of hypothyroidism. The symptoms were not associated with any anxiety state and seemed attributable to the effects of obesity and advancing years. Yet in patients who had suffered from Graves's disease they might be mistaken for recurrence or cardiac effects.

**Cases 8 and 9.**—Two women; both had menopausal symptoms at the time of follow-up. They complained of irritability, tremor, sweats, flushings, and lassitude, and both had residual eye signs of Graves's disease. There was thus some superficial resemblance to recurrent thyrotoxicosis in each case, but the B.M.R.'s were normal (+4% and +9%), and administration of stilboestrol afforded considerable relief.

#### DISCUSSION

Perhaps the salient practical point which emerges from this study is the non-specificity of the symptoms of Graves's disease. It has been shown that single symptoms, or several in combination, may also exist in conditions such as anxiety states, the menopause, cardiac neurosis, and chronic invalidism. The symptoms may be confusing in an initial diagnosis of Graves's disease, but they may be more so in a follow-up study when the eye signs of Graves's disease may also have persisted. Apart from the eye signs, the ultimate basis of symptoms is a nervous instability, whether it is engendered by the various conditions mentioned or by the general body hyperexcitation in active Graves's disease.

This inquiry has perhaps clarified the position of the "Graves's constitution" in relation to the development of the disease and as a cause of symptoms after thyroidectomy. Graves's disease had arisen in people of normal and abnormal type, and there was no constant underlying personality in those studied. This confirmed the unique observations of Fitz (1944) on the development of Graves's disease in 33 people on whom he had conducted routine medical examinations over a period of twenty years. He could not detect in retrospect any anatomical or constitutional features by which the development of Graves's disease might have been predicted. Thus he could not support the concept of a "Graves's constitution" and concluded that Graves's disease was "a medical misadventure which may befall anyone."

Nevertheless, it must be conceded that constitutional symptoms were aggravated during the course of Graves's disease and reverted to their former intensity after thyroidectomy. To this limited extent only are the views

of Warthin (1928) and Moschowitz (1930) acceptable, for it seems clear that constitutional symptoms are neither invariable nor due to any constant personality type. Still less acceptable is the view of Moschowitz and Bernstein (1944) that neurocirculatory asthenia is the background of Graves's disease and the cause of post-operative symptoms. The patients examined in this study did not have neurocirculatory asthenia before the onset of Graves's disease, and the enormous mass of evidence accumulated during the two world wars does not support any connexion between the two conditions. Two patients in this series certainly developed a cardiac neurosis after thyroidectomy; but the condition is common, and there is no reason why those who have had Graves's disease should not occasionally develop it.

The fact that postoperative symptoms arose as a result of the emotional effect of Graves's disease and thyroidectomy requires serious consideration. Examples have been given of the anxiety and invalidism which occurred, particularly if the postoperative course had been complicated or prolonged hospital attendance had been needed. These are sometimes unavoidable, but much could be done by encouragement, reassurance, and simple explanation to prevent misinterpretation of symptoms. This applies to all patients but especially in Graves's disease, because the symptoms of anxiety and invalidism may resemble those of Graves's disease, and patients are apt to be kept indefinitely under suspicion of recurrence. Some patients will not admit the cure of any disease so long as they attend hospital; hence an early discharge with reassurance may do more good than much protracted and cautious observation. Further, reassurance must be definite and forthright. Dubious or unconvincing reassurance was a potent cause of cardiac neurosis among suspected cases of heart disease during the late war (Wood 1941, Hill and Dewar 1945), and it has a much wider scope for evil in civilian hospital practice.

This study suggests that, apart from the eye signs and various constitutional symptoms, the ultimate results of thyroidectomy for Graves's disease might be improved by simple psychotherapy, which entails no more than convincing reassurance, explanation of symptoms when needed, and a sympathetic understanding of the patient.

#### SUMMARY

Of 33 cases of Graves's disease examined, in which thyroid function was normal at intervals ranging from two and a half to ten years after thyroidectomy, 31 retained symptoms at the time of follow-up.

Eye signs were the only true residua of Graves's disease.

Other symptoms were attributed to constitutional factors, to the emotional effect of the disease and operation, or to causes unconnected with either.

The non-specificity of the symptoms of Graves's disease is emphasised.

No evidence was adduced of any constant underlying constitution or personality which might be a background to Graves's disease or a cause of symptoms after thyroidectomy.

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## FLOSS-SILK LATTICE REPAIR FOR INGUINAL HERNIA

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DURING the last ten years the floss-silk posterior lattice-repair operation which is based on the darn-and-staylace procedure of Handley (1918), has been used exclusively, with excellent results, for all cases of direct inguinal hernia. It has also been adopted for large oblique herniæ in which the internal ring and the floor of the inguinal canal have been unduly stretched, or where the muscular and fascial supports appear weakened and atrophied, and for certain types of recurrent inguinal hernia.

The immediate and late results of this operation in more than 1000 cases have been so gratifying that we now rarely make use of Gallie's (1921) fascial repair, McArthur's (1904) operation, the Halsted (1893) methods of repair, or Brandon's (1945) "lateralisation of the cord" when dealing with the varieties of rupture under consideration.

### PREPARATION OF PATIENT

The inguinal regions and the upper third of the thighs are carefully shaved and cleansed with soap and water a few hours before the operation is due to start. No antiseptic solution is applied to the operation site while the patient is in the ward. For the average patient a spinal anaesthetic is efficient, but for the aged and for the poor-risk case cyclopropane is the anaesthetic of choice and is, in our opinion, far better than a field block. We use local anaesthesia only for those cases of strangulated hernia in which the operative risk is very great.

The patient is placed on his back on the operating-table, which is slanted in a slightly anti-Trendelenburg position, after which a sandbag is placed beneath the buttocks to throw the inguinal regions forward, and the knees are flexed by placing them on a small round pillow to relax the abdominal muscles.

The inguinal regions, the genitals, the upper third of both thighs, the whole abdomen, and the flanks are then lavishly painted with 'Merthiolate' before the mackintosh sheets and the abdominal and limb drapes are applied. When this has been done, the small exposed quadrilateral area of skin in the inguinal region is again freely painted with merthiolate.

### INCISION

A transverse crease incision is used, starting one finger-breadth below and medial to the anterior superior iliac spine, crossing the inguinal ligament at the junction of the middle and outer thirds and finishing one finger-breadth above the pubis and  $\frac{1}{2}$  in. short of the midline.

This incision has many advantages over the usual oblique one, which is placed  $\frac{1}{2}$  in. or so above and parallel to the inguinal ligament. The cosmetic result of the crease incision is better, because (1) the fine scar lies in one of the natural flexion creases of the body; (2) keloid formation is almost unknown; (3) it crosses the deep plastic repair at only one point, thus minimising the risks of infection from the surface to the vulnerable muscular planes beneath; and (4) the exposure obtained during the dissection is, with good retraction, more than ample.

The crease incision is made cautiously through the skin down to the subcutaneous tissues in which the superficial femoral vessels may be seen coursing upwards, inwards, and outwards. The knife, which must be considered as contaminated after making this incision, is discarded, and a fresh one is picked up for continuing the dissection. The superficial femoral blood-vessels are identified and isolated from the fatty tissues before they are clipped with Halsted or Dunhill forceps and divided. All small bleeding points are likewise seized with fine-pointed artery forceps, and each is tied off with no. 0 twisted silk, the ligatures being cut as close to the knot as possible.

When complete hæmostasis is assured, the edges of the wound are once again painted with merthiolate and four tetra-cloths are affixed to the wound margins with Scott

Ridout forceps. All the instruments which have been used in making the incision are now removed, and a fresh set is used for the remainder of the operation until the skin margins are ready for suturing, when once again another set of instruments is used. Three sets of freshly sterilised instruments are thus used during the three most important stages of the operation—the making of the incision, the dissection and repair of the hernia, and the closure of the wound.

### DISSECTION

The deep fascia overlying the external oblique aponeurosis is divided in line with the incision, and the fatty areolar tissues clinging to the aponeurosis are reflected with the handle of the knife upwards and outwards to 1 in. beyond the internal abdominal ring and downwards as far as the inguinal ligament but not beyond it. Dissection with the knife should not be carried down to the external ring, because numerous blood-vessels pierce the intercolumnar fascia here and are difficult to clip with hæmostats after they have been divided. Hæmorrhage here must be avoided at all costs, because it is difficult to detect and to control, and if unobserved may subsequently give rise to a troublesome hæmatoma which may suppurate or at best take weeks to absorb. When, therefore, the dissection approaches the external abdominal ring, the knife should be laid aside, and a gauze swab should be wrapped round the right index finger, which is then used to push aside the structures here to display the pillars of the ring and the emerging cord.

A small cut is next made with a knife in the external oblique aponeurosis in the line of the pillars and about 1 in. from the point where they diverge. The upper and lower leaves are steadied and elevated with artery forceps to allow a finger to be inserted beneath the aponeurosis and the underlying internal oblique and cremaster muscles. This finger gently detaches any structures which may be adherent to the under-surface of the aponeurosis, such as the ilio-inguinal and iliohypogastric nerves and the fibres of the cremaster muscle.

The incision in the aponeurosis can now be safely extended upwards and outwards to a point 1 in. above the internal abdominal ring and downwards and inwards through the external ring and the arching fibres of the attenuated intercolumnar fascia.

The upper leaf of the aponeurosis is then reflected off the underlying structures with sweeping strokes of the finger or with the handle of the knife, freely displaying the arching muscular fibres of the internal oblique, the cremaster muscle, the iliohypogastric nerve, the shiny outer border of the rectus sheath, and the lateral aspect of the pubic crest from which the rectus muscle arises.

The lower leaf is cleared until the inner surface of the inguinal ligament is visible as far as its point of insertion into the pubic spine. As the cremaster muscle is being liberated from the lower leaf, great care must be taken not to crush or otherwise injure the ilio-inguinal nerve, which lies partly on the surface of this muscle and along a line which runs roughly parallel with the inguinal ligament.

A fold of cremaster muscle immediately below the ilio-inguinal nerve is picked up with two dissecting forceps and divided with scissors longitudinally, thus exposing the sub-cremasteric areolar space. The closed points of the scissors are pushed up and down in this space to clear the cord until it is quite free, and the muscle is then divided in the line of its fibres, upwards and outwards to within  $\frac{1}{3}$  in. of the arching fibres of the internal oblique muscle and downwards through the external ring. In dividing the muscle in an upward direction a small arterial twig of the deep epigastric artery is invariably cut across and should be instantly caught and ligated; and in cutting the cremaster muscle in the opposite direction care must be taken to preserve the ilio-inguinal nerve where it dips towards the neck of the scrotum.

The upper and lower leaves of the cremaster muscle are grasped with Allis forceps and held apart to aid in the isolation of the cord. The upper leaf should be dissected first, after which the lower leaf is freed, and any muscle fibres which cling to the cord are gently pushed aside by gauze dissection, so that this structure can be picked up between the thumb and index finger of the left hand and drawn upwards and outwards from its bed (fig. 1). The loose attachments of the cord posteriorly are quickly freed, so that all the constituents of the cord from the external to the internal ring can be readily examined through its diaphanous covering of infundibuliform fascia.

REPAIR

If, after removal of the sac of an oblique hernia, the internal ring is found to be widely dilated and the posterior floor of the canal partially or wholly deficient, in fact so weak and yielding as to constitute a direct rupture, it is wiser to repair the canal throughout its entire length with a floss-silk darn, transplanting the cord subcutaneously, than to rely on a strict anatomic reconstruction.

In many such cases it is tempting to dissect out the transversalis fascia and to affix this membrane to the inguinal ligament or to Cooper's ligament with sutures, as suggested by McVay and Anson (1942), in the hope that this attenuated fascial curtain will form an efficient barrier against subsequent herniation. In practice, however, this plan, even when the transversalis fascia has been reinforced with fascial strips taken from the thigh or from the external oblique aponeurosis, has not proved entirely reliable in my hands and has in consequence been more or less abandoned.

When a large indirect hernia is associated with a direct hernia or with a so-called diverticulum of the transversalis fascia, after the oblique sac has been opened the index finger can be introduced into the peritoneal cavity to explore the defect in the floor of the inguinal canal from behind, after which all the redundant peritoneum can be readily gathered laterally to the deep epigastric artery and cut away after the neck of the sac has been closed from within with a purse-string suture of strong silk.

Again, in the common type of direct inguinal hernia there is much to be gained by incising the small tongue of peritoneum

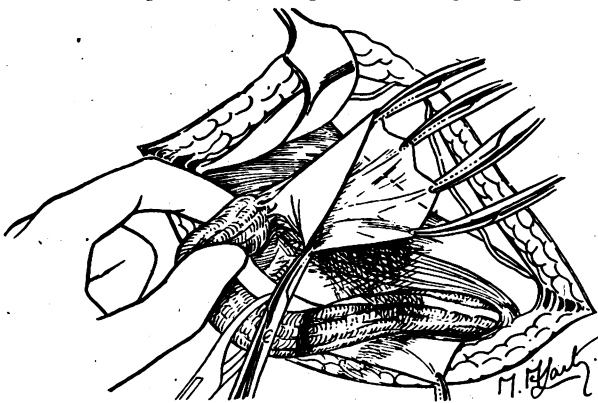


Fig. 1.—Freeing of oblique sac before neck is transfixed and ligated.

which clings to the medial border of the cord at the internal ring, and testing by touch the integrity of the posterior wall of the canal from behind. The cut margin of the peritoneal sac is clipped with haemostats, and by a combination of gauze dissection and traction the loose membrane can be easily drawn forwards between the issuing cord and the deep epigastric artery, and the excess excised after the aperture has been sutured in a watertight fashion.

The transversalis fascia is next sutured to the inguinal ligament from the point where the cord issues from the internal ring to the spine of the pubis. It is important to draw this fascial sheet over the ligated stump of an oblique inguinal hernia and, to fix it to the inguinal ligament with fine silk sutures. There must be no weak spot or gap between the medial aspect of the cord and the deep epigastric blood-vessels.

The cut margins of the cremaster muscle are now approximated behind the cord to facilitate the introduction of the floss-silk suture to fortify, however feebly, the posterior floor, and to reduce the calibre of the cord, which is subsequently made to lie subcutaneously (fig. 2).

THE LATTICE

The operative field is now ready for the introduction of the floss-silk lattice.

Floss silk is to be preferred to catgut or other non-absorbable suture material because it readily becomes incorporated into the tissues in which it is buried, its numerous gossamer-like fibrils lying loosely together form an excellent scaffolding for the unhindered invasion and infiltration of fibroblasts, and it produces in a very short time a fibromuscular sheet strong enough to withstand the greatest strain. Further, it is cheap, readily obtainable, easy to sterilise, and simple

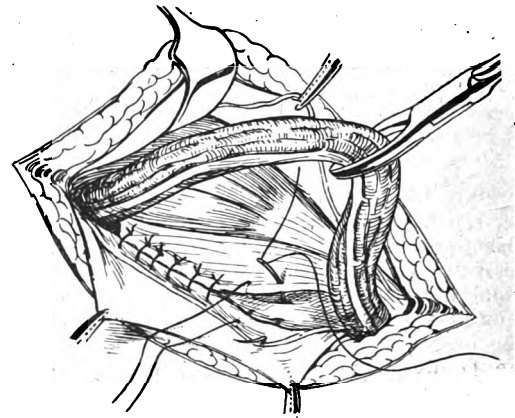


Fig. 2.—Suturing of edges of cremaster muscle and transversalis fascia to inguinal ligament between medial aspect of issuing cord and pubic spine.

to insert when threaded on small or medium-sized round-bodied trocar-pointed Mayo needles. Floss silk is again preferable to fascia-lata strips because it does not add another operation to the hernial repair, and the fibrous tissue response following the introduction of this suture material is just as great as when living autogenous sutures are used.

Floss silk is supplied in ampoules (Messrs. John Bell & Croyden) ready for use or on spools. The ampoule (containing a small spool of about one yard of floss silk) is immersed in Bard-Parker antiseptic solution for about half an hour before the operation is due to start. After the silk has been removed from the glass container it is thoroughly rinsed in sterile saline solution and then in doubly distilled water to remove all traces of chemicals which may be irritating or injurious to the tissues.

It is now my custom to take a 24-in. strand of floss silk from a spool and to boil it for an hour before use. The floss silk should not be immersed in weak mercurial lotions, flavine solution, sulphonamide pastes, liquid paraffin, and the like, because these substances irritate the tissues and excite an outpouring of serum—one of the greatest dangers to a promising herniorrhaphy. Lately, however, we have been soaking the floss silk in a highly concentrated solution of penicillin immediately before use.

The floss silk is introduced in the following manner. The first stitch takes a firm bite of the periosteum of the pubic crest, and then another bite at the origin of the tendon of the rectus muscle. The end of the suture is not knotted at this stage but caught with artery forceps. The cord is held out of the way while the suture is continued in a lateral direction, taking first a bite of the periosteum over the pubic spine, then of the edge of the rectus sheath, then of the inguinal ligament, then of the conjoined tendon, then of the inguinal ligament, then of the conjoined tendon, then of each side of the cremaster, then of the inguinal ligament, and then back again to the conjoined tendon, and so on (fig. 3). The stitches are inserted almost vertically and close to one another without any strain or pull on the muscle or the inguinal ligament.

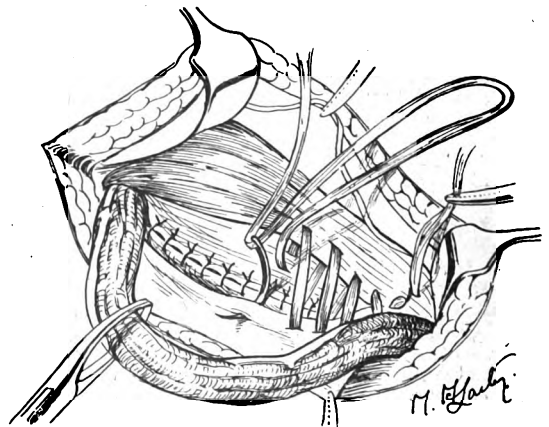


Fig. 3.—Start of floss-silk darn.

As the internal ring is approached, the cord is pulled firmly outwards and suture is continued until it can be felt that an opening only the size of the tip of the little finger remains. At one time we were in the habit of reinforcing the internal ring by buttressing the cord on all sides with floss-silk sutures in the manner used by Gallie in his fascial repair operation; but now we omit this step, preferring to place the emerging cord between the soft yielding muscles laterally and the silk wall that is built up on its medial aspect (fig. 4).

The suture is next continued back towards the starting-point, but this time with much wider traverse, taking on one side a bite of the inguinal ligament between the stitches of the previous row, then on the other side the fibromuscular conjoined tendon. The stitches are once again inserted without the slightest degree of tension and are passed in such a manner that the whole of the posterior floor of the inguinal canal is effectively darned with a lattice of floss silk (fig. 4).

The stitch is completed by taking a good bite of the periosteum over the pubic spine and the crest of the pubis and by tying the ends of the silk sutures together so that the

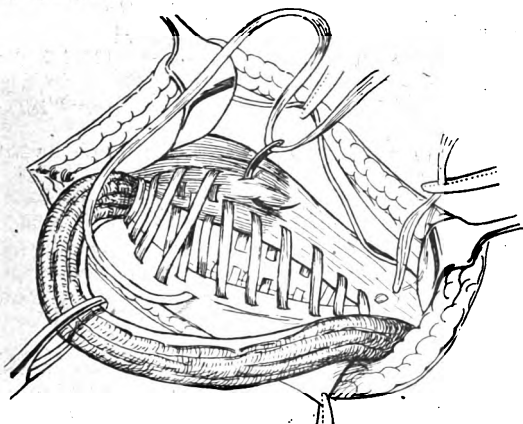


Fig. 4.—Posterior lattice repair nearing completion. When this suture again reaches starting-point, it picks up a good bite of periosteum of pubic spine, and ends are tied together. External oblique aponeurosis is sutured behind cord to provide maximal reinforcement for posterior wall of cord.

knot will lie beneath the aponeurosis of the external oblique close to the pubic crest.

#### CLOSURE OF WOUND

With the cord elevated, the edges of the external oblique aponeurosis are approximated with a series of interrupted sutures of fine silk; or, if the aponeurosis has been much stretched, the edges may be overlapped. The cord is finally laid back on its new bed before the deep fascia and the subcutaneous tissues are drawn together with interrupted stitches of fine silk. The skin edges are sutured with vertical mattress sutures of fine black silk or 'Deknatel.'

The wound is finally painted with merthiolate, and a small gauze dressing is applied and kept in place by a broad strip of elastic adhesive bandage.

#### ASSESSMENT OF OPERATION

In our last 100 consecutive cases there has been sepsis in 2 cases; but, on removal of the offending ligatures and injection of penicillin 250,000 units six-hourly for a few days, the wounds have healed satisfactorily and apparently strongly.

No operation can be compared to this floss-silk lattice method for large herniæ or recurrent herniæ in enfeebled patients. The all-round recurrence-rate following this method is not higher than 3%, and this includes cases in which the operation has been performed in obese patients, in the aged, and in patients who have had two or three, or even sometimes four, previous herniorrhaphies. Sepsis most often develops in obese patients. We make a point now of operating on only one side at a time in cases of bilateral hernia, and we avoid supplementary operations, such as those for varicocele and hydrocele, when operating on a hernia.

References at foot of next column

## ANTHISAN IN THE TREATMENT OF ALLERGIC RHINITIS

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Fourneau and Bovet (1933) first demonstrated that certain phenolic ethers counteracted the action of histamine in vivo and in vitro. Since then many compounds have been synthesised having this action. Those of most promise are 'Anthisan,' 'Antistin,' 'Benadryl,' and 'Pyribenzamine.' Of these pyribenzamine is not generally available in this country.

These compounds specifically counteract the physiological effects of histamine: (1) they raise a blood-pressure which has been lowered by histamine; (2) they prevent contraction by histamine of intestinal and uterine strips from guineapigs, both when the drug is added to the fluid in which the strip is suspended and when it is administered to the intact animal; (3) they have some analgesic action by counteracting the effects of histamine on the cutaneous ends of pain nerves; (4) they prevent death in experiments on animals from the injection of an otherwise lethal dose of histamine; (5) they diminish capillary permeability resulting from histamine and counteract the histamine weal; and (6) they inhibit secretion induced by histamine in lacrimal and salivary glands and in the mucous glands of the bronchial tree. Because undue secretion is a feature of both allergic rhinitis and asthmatic attacks, this last action is of clinical use.

'Anthisan,' also called 'Neoantergan,' is pyranisamine maleate (N-dimethylamino-ethyl-N-p-methoxy-benzyl- $\alpha$ -aminopyridine maleate). Dews and Graham (1946) published pharmacological details. Hunter (1947) reported on the treatment of 14 cases of urticaria treated with anthisan. Hunter and Hill (1947) found anthisan of value in the control of sensitivity to liver extract and insulin. In the present series 48 patients have been treated with anthisan, of whom 44 were followed up and had a complete course of treatment. Anthisan was of benefit to all the 6 hay-fever cases and to 29 (76%) of the 38 cases of vasomotor rhinitis:

Conditions	No. of cases	Great benefit	Moderate benefit	Little or no benefit	Reactions
Hay-fever..	6	5	1	—	—
Vasomotor rhinitis	38	12	17	9	4

#### VASOMOTOR RHINITIS

The scheme of treatment was to start with one tablet (0.1 g.) three times a day for five days and, if there were no severe side reactions, to increase this to 0.2 g. three times a day. This was continued for ten days. In 15 cases benefited by anthisan the effect of dummy anthisan tablets was tried. After this the effect of benadryl was tried before returning the patients to regular anthisan dosage. In 10 stabilised cases an attempt was made to reduce their dosage. Of the 38 cases 4 (10%) showed a side reaction, but in no case did this interfere with treatment. The reactions were observed with the initial dosage and tended to pass off as the treatment continued. In 3 cases there was some drowsiness, and in 1 a loss of appetite.

Of the 15 patients benefited by anthisan and then given dummy anthisan tablets 10 complained that their

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condition had deteriorated, 3 did not note any difference, and 2 thought they were better than before.

All the patients were given benadryl for comparison of effects. In all cases where anthisan was not effective no effect was obtained from benadryl. Of the 29 patients who were benefited by anthisan in this small series 19 thought anthisan better, 8 thought benadryl better, and 2 were not sure. This accords with the findings of Friedlaender et al. (1947), who in animals found neoantergan the most efficacious of the anti-histamine drugs in preventing death from injections of otherwise lethal doses of histamine.

With 2 exceptions in the present series, the improvement in symptoms was accompanied by a corresponding improvement in the state of the nasal mucosa. The pale boggy turbinates shrank and became pink, while the amount of secretion in the nose returned to normal. Administration of anthisan for weeks or months apparently did not damage the nasal mucosa.

The dosage needed to keep the patient in comfort was as a rule 0.6 g. a day. The treatment was tolerated well by children with 0.3 g. a day. In 10 stabilised cases an attempt was made to reduce the dosage gradually, but failed. A constant dosage seems to be required which cannot be reduced without return of part of the symptoms. The dosage of 0.6 g. a day was preferred in three doses, rather than divided into six doses.

#### HAY-FEVER

Only 6 patients with hay-fever were treated, with complete cessation of attacks in 5 and slight symptoms only in 1. Of the 5 patients successfully treated with anthisan 2 had been treated unsuccessfully with mixed vaccines in the past, and another 1 had not benefited from zinc ionisation. The dosage was 0.2 g. three times a day till the end of the pollen season, when treatment was stopped.

#### DISCUSSION

Anthisan in allergic rhinitis is an effective anti-histamine drug. Like all these drugs, it does not cure, and must be given for as long as an effect is desired. When the treatment is stopped, there is a quick relapse of the patient's condition, beginning in 6-8 hours. Desensitisation remains the treatment of choice, and anti-histamine drugs should be used only where the offending antigen cannot be found, or pending desensitisation.

Clinical evaluation is difficult, since allergic manifestations are often self-limiting. In a chronic condition spontaneous improvement may take place at any time because of the sudden disappearance of certain inhaled or ingested antigens from the patient's environment, and because of the likelihood of spontaneous desensitisation to certain antigens. Therefore conclusions about the effect of anti-histamine drugs should not be drawn until the patient has had a long treatment. Psychological influences are very important in allergy. The administration of a tablet or a capsule may bring relief, especially if the drug has been popularised by the lay press.

The incidence of side-effects is generally accepted as 20-25%. Drowsiness is the most common. The low incidence of mild side-effects with anthisan in this small series of cases was noteworthy.

Anthisan deserves a definite place in the management of nasal allergy. A new series of compounds more effective and less toxic in experiments on animals than any yet used has been described (Halpern 1947).

#### SUMMARY

In all of 6 cases of hay-fever, and in 29 of 38 cases of vasomotor rhinitis, anthisan was effective. Side reactions developed in 4 of the 44 cases, but they were never severe.

I am indebted to Mr. R. P. S. Kelman, F.R.C.S., medical superintendent of Selly Oak Hospital, for permission to

publish this report, and to Pharmaceutical Specialities (May & Baker) Ltd. for supplies of active and inert anthisan.

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## NON-SUPPURATIVE HEPATITIS

### REPORT OF A CASE

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THIS case of non-suppurative hepatitis is reported because it has been studied in detail during its whole course, which ended fatally ten months after the onset. Brief reference to the case has previously been made by Wood et al. (1948) in a review of non-suppurative hepatitis.

The patient was a youth of 19 whose illness began with jaundice, fever, and pain over the liver. The acute phase passed into mild chronic ill health. He died from acute liver failure following an apparently mild upper respiratory infection. The study was made by clinical observation, serial biochemical tests for liver function, and aspiration biopsy of the liver in the second and sixth months of the illness. Finally, a full necropsy was made.

The cause of the hepatitis in this case was not determined, but in our opinion it was attributable to the virus of infective hepatitis. This virus is known to cause an acute hepatitis which is seldom fatal in the early acute phase, but occasionally the disease does not

resolve and becomes chronic. There are no specific serological tests for the disease, and no laboratory animals susceptible. Inoculation of human volunteers is the only known way of identifying the virus in the acute form, but recent attempts by Neefe et al. (1947) to transmit the

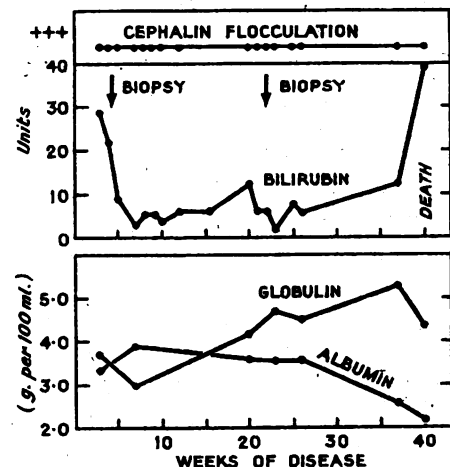


Fig. 1.—Positive cephalin flocculation and fluctuations in serum-bilirubin, serum-globulin, and serum-albumin levels in chronic non-suppurative hepatitis probably due to virus of infective hepatitis.

disease from chronic cases gave inconclusive results.

Infective hepatitis is endemic in Melbourne, where the patient lived, but no history of contact with other cases of jaundice could be obtained. His diet had been adequate, and he had not been exposed to chemical poisons. No injection which might cause homologous serum jaundice had been given.

\* This work was aided by a grant from the National Health and Medical Research Council of Australia.  
 † Wyeth Fellow in Medicine.

The patient's mother had died six years previously from chronic hepatitis. However, she had been addicted to alcohol for years, and her diet was inadequate.

#### CASE-RECORD

A boy, aged 19, was first admitted to the Royal Melbourne Hospital on Aug. 16, 1946. His previous health had been satisfactory and he had been a keen amateur boxer. His occupation was a cabinet-maker and his diet had been adequate. There was no history of working with chemicals. Five weeks before admission he had developed a mild febrile illness with cough, shivers, and malaise, followed two weeks later by epigastric discomfort and jaundice. Urine contained bile, and stools were pale.

On examination he was a moderately ill youth with obvious jaundice of the skin and conjunctivæ. Temperature not raised. Liver palpable 4 cm. below right costal margin. Spleen not enlarged. Urine contained bile pigment and salts, and stools were clay-coloured. No other abnormality found.

**Biochemical Findings.**—On admission to hospital three weeks after the appearance of jaundice, patient showed most

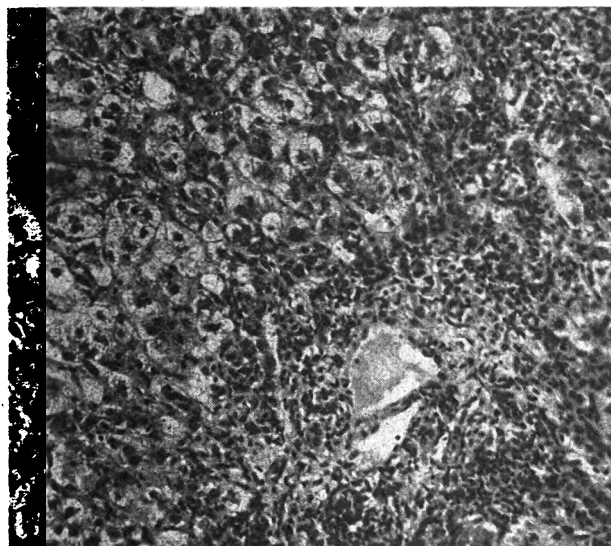


Fig. 2.—Aspiration biopsy in second month of illness, showing disturbance of liver structure, with disappearance of liver-cells, cellular proliferation of central lobular region, and connective-tissue proliferation. Haematoxylin and eosin. ( $\times 164$ )

of the biochemical findings commonly seen in moderately severe infective hepatitis. Serum-bilirubin level raised (29 units), bilirubin and bile-salts present in urine, but urobilin not increased. Hippuric-acid excretion impaired (1.3 g.); cephalin-flocculation test strongly positive; serum-globulin level raised (3.7 g. per 100 ml.), with inversion of albumin/globulin ratio (0.9). Prothrombin-index satisfactory (83%); alkaline serum-phosphatase level not raised (12 units). Blood-urea 30 mg. per 100 ml., serum-amylase 8 units, Casoni test for hydatid disease negative, Wassermann test negative, Hb 14.1 g. per 100 ml., leucocytes 5400 per c.mm. (neutrophils 33%, lymphocytes 62%).

**Course.**—The jaundice slowly faded until it was just perceptible. The patient was discharged from hospital three months after the onset of his illness. Slight jaundice persisted with exacerbations until his last admission to hospital eight months later. During these eight months he suffered from weakness, dyspepsia, and frequent attacks of right upper abdominal pain. He considered that his symptoms were made worse by strenuous exercise. He could not obtain a suitable diet owing to domestic difficulties, so was sent to a farm in the country where he received excellent food. There he improved but after two months he had a minor relapse and returned to the city. An almoner's report at this time was as follows:

"*Patient's holiday*: on March 3, 1947, patient was sent from this hospital for nine weeks' holiday with Mr. and Mrs. X on a farm forty miles from Melbourne. At first he made good progress and was very popular. For the last three weeks of his stay, patient says he was not well. Mr. and Mrs. X report that patient lost interest in anything that meant work and did not feel well enough to do any work but would be quite animated and take an active part in any social outing. Mr. X offered patient light

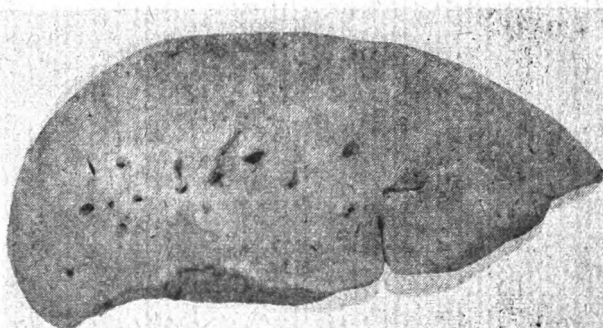


Fig. 4.—Surface of liver, showing pale homogeneous appearance with scattered areas of surviving liver tissue.

employment on the farm, but has now withdrawn this offer as he thinks that, apart from his ill health, patient was 'born lazy.'

"*Present care*: patient is now living with his grandmother and his aunt in the city of Melbourne, the aunt being his legal guardian. Patient is dissatisfied with his present living conditions, comparing them unfavourably with those on the farm. His grandmother and his aunt are sick of his constant conversation about his liver, his weeping, his melancholic expression, and his refusal to do any work."

He began light work a month later. In June, 1947, eleven months after the onset of his illness, he developed a mild upper respiratory infection. He slowly became weaker, and the jaundice became deeper. Two weeks later he began to vomit, and next day he became semicomatose and was readmitted to hospital.

On readmission he was irrational, restless, and twitching. An intravenous infusion of glucose saline and casein hydrolysate was begun but brought about no improvement. Next day the patient vomited more than a pint of blood and lapsed into deep coma. Lumbar puncture yielded clear cerebrospinal fluid. He died a few hours later.

During the course of his illness serial tests were made on the cephalin-flocculation, serum-bilirubin, serum-albumin, and serum-globulin. These are shown in fig. 1. During his final relapse, when he was admitted to hospital in a semicomatose condition, serum-bilirubin level was raised (40 units per 100 ml.), there was increased urobilin in urine, cephalin flocculation was still strongly positive, and albumin/globulin ratio was reversed, blood-urea level was not raised, and blood-sugar was within normal limits. Examination of urine by one-dimensional chromatography by Dent's (1946) method showed increased intensity of all bands, especially in leucine and tyrosine zones.

**Aspiration Biopsy in Second Month (fig. 2).**—Some distortion of hepatic structure, but whole lobular outline visible. Most pronounced changes were in portal tracts, which were greatly thickened and filled with inflammatory cells of all types.

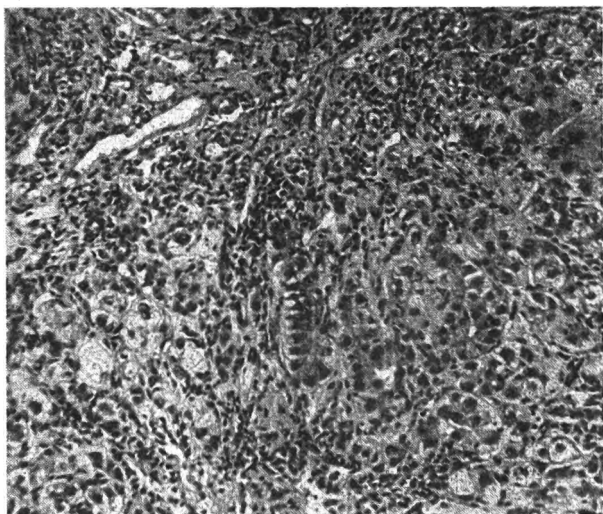


Fig. 3.—Aspiration biopsy in sixth month of illness, showing further disturbance of liver structure, decrease in number of liver-cells, and non-suppurative inflammation with fibrosis. Haematoxylin and eosin. ( $\times 164$ )

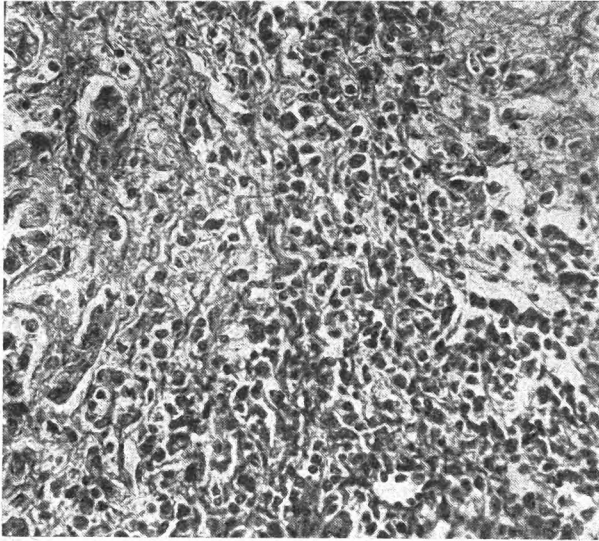


Fig. 5—Necropsy specimen of liver, showing a few isolated liver-cells and intense cellular infiltration and fibrosis. Hæmatoxylin and eosin. ( $\times 265$ .)

There was evidence of bile-duct proliferation. Liver-cells showed slight accumulation of fat. Inflammatory cells extended between lobules from periphery.

*Aspiration Biopsy in Sixth Month (fig. 3).*—The disease had extended considerably since the previous biopsy, there now being complete distortion of normal hepatic structure. Numerous islands of proliferating liver-cells were surrounded by very cellular fibrous tissue. In places this fibrous tissue invaded islands of liver-cells. Inflammatory cells were macrophages, small round cells, and numerous fibroblasts. Some evidence of bile-duct proliferation.

*Necropsy.*—Bile-stained fluid in all serous cavities. A few scattered petechial hæmorrhages in endocardium of left ventricle. Mediastinal and para-aortic lymph-glands enlarged, firm, and elastic. Spleen enlarged (15 oz.) and congested.

Liver small (43 oz.), smooth, firm, and extremely tough; cut surface showed a homogeneous greenish-grey background in which were set a few small yellowish areas (fig. 4). Histological examination showed a dearth of liver-cells, except for a few small aggregates corresponding to yellowish areas seen macroscopically (figs. 5 and 6). Remainder consisted of collagenous tissue densely infiltrated with macrophages, fibroblasts, and small round cells. Few blood-vessels. Very

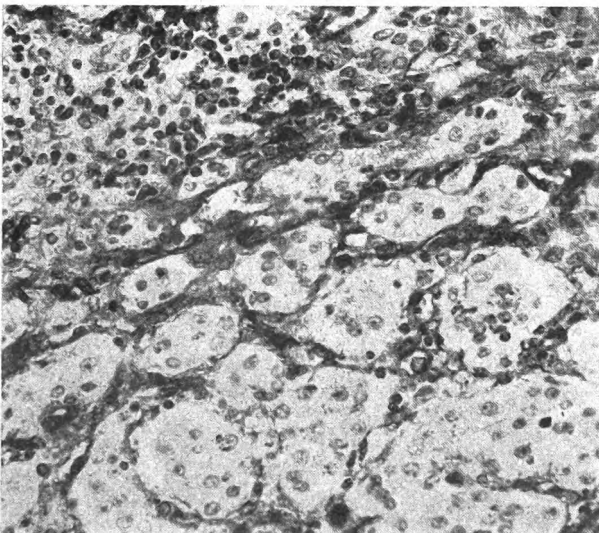


Fig. 6—Necropsy specimen of liver, showing an area of surviving cells separated by bands of fibrous tissue with a positive reaction for alkaline phosphatase. The cellular connective tissue of which the bulk of the liver consists can also be seen. Gomori's stain. ( $\times 265$ .)

little evidence of liver-cell degeneration, though bile-duct elements appeared to be increased.

No macroscopic abnormality seen in alimentary and central nervous system. Testes small and atrophic.

#### ILLNESS OF THE MOTHER

The patient's mother died at the Royal Melbourne Hospital six years earlier at the age of 43 from "necrosis of the liver." For ten years before the onset of her illness she had been subject every three or four weeks to alcoholic bouts lasting three or four days, during which she took practically no food. Her illness, which lasted five months, began with intermittent jaundice with right upper abdominal pain, radiating to the back. During the last three months the liver was just palpable, the jaundice was constant but not intense (5 units), the hippuric-acid excretion was impaired (1.2 g.), and the Takata-Ara test was positive. Prothrombin-time was within normal limits. The Wassermann reaction was negative and the erythrocyte fragility normal. There was no pyrexia until the last five days of her illness. Necropsy showed the external biliary system to be clear. The liver was enlarged, with general disappearance of the normal structure and with patchy necrosis. Microscopy

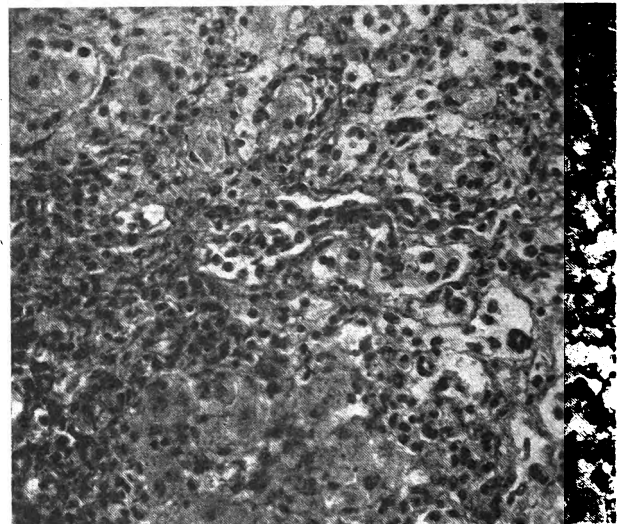


Fig. 7—Necropsy specimen of liver of patient's mother, showing remarkable histological resemblance to patient's liver. Hæmatoxylin and eosin. ( $\times 265$ .)

showed the normal liver structure to be completely lacking (fig. 7). Remnants of lobular structure were occasionally seen in which the liver-cells were separated by fine connective tissue containing numerous lymphocytes and young fibroblasts. The liver-cells showed degenerative changes, including loss of outline, deficient staining qualities, and granularity of cytoplasm. A few showed hyperplasia, but no aggregates of hyperplastic cells were seen. Blood-vessels were scanty, but bile-duct elements were increased.

#### DISCUSSION

With the development of biochemical tests and aspiration biopsy of the liver we are now better equipped to recognise cases of chronic non-suppurative hepatitis. We still await the discovery of a simple specific test to identify the group caused by the virus of infective hepatitis.

The case reported here was probably caused by the virus of infective hepatitis. The patient, failing to recover in the second or third month of his illness, drifted into the chronic stage, a rare but distressing event in this disease. After nine months he was still unwell with mental and physical debility. Slight jaundice

was always apparent. The biochemical tests remained abnormal, and two liver biopsies in the second and sixth months showed considerable deterioration of the liver. Death was due to liver failure in the eleventh month of the illness. On the day before death chromatography showed increased urinary amino-acids, the blood-urea level was not raised, and there was no hypoglycaemia.

The case-record and necropsy report of the patient's mother have been included because of the similarity in the course, biochemical tests, and histological findings. However, the mother gave a history of chronic alcoholism and dietetic deficiency.

The development of fatal non-suppurative hepatitis in both mother and son was probably fortuitous, but it is advisable to consider the possibility that a genetic (constitutional) factor played some part in both illnesses. The exciting cause in our case was presumably the virus of infective hepatitis, in the mother her chronic alcoholism (Witts 1947). But the standard pattern of disease produced by either of these initiating causes does not include the final progressive liver degeneration shown by both patients. The extreme similarity in the final clinical and pathological state strongly suggests some genetically determined abnormality that led to the same type of progressive liver damage in the two persons. The nature of the genetic abnormality, if it exists, is a matter for future research. The possibility that in some people primary damage to liver-cells initiates an abnormal auto-antibody production which gives rise to secondary and progressive liver damage is one hypothesis that would need consideration.

SUMMARY

A fatal case of non-suppurative hepatitis, probably due to the virus of infective hepatitis, is described.

The patient's mother had also died of non-suppurative hepatitis after bouts of alcoholism.

This coincidence may be either fortuitous or due to a genetic factor.

We wish to thank Prof. F. M. Burnet and Dr. I. J. Wood, of the Walter and Eliza Hall Institute of Medical Research, for their assistance with this study; and Mr. Mathei, photographer of the University of Melbourne Faculty Workshops, for preparing the photomicrographs.

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INCIDENCE OF CHRONIC HEPATITIS IN WOMEN IN COPENHAGEN 1944-45

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AN increase in the frequency of acute hepatitis during the war of 1939-45 was observed in Denmark as in most other countries. The increase began in 1941 and presumably culminated in 1945. From 1944 there were also a conspicuous number of cases of malignant hepatitis in Denmark. This form of hepatitis differs from the familiar infective hepatitis by its protracted course, for it often extends over eight or nine months and ends

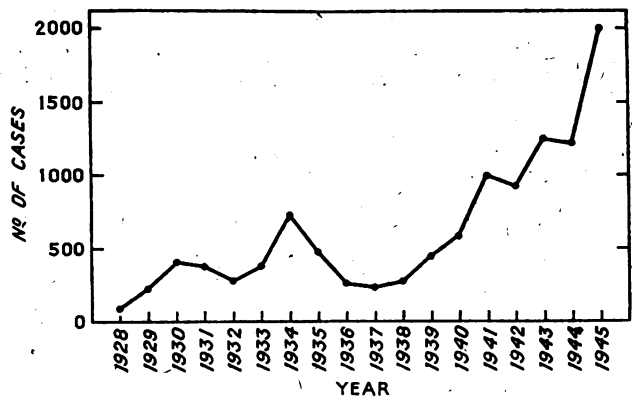


Fig. 1.—Notifications of infective hepatitis in Copenhagen in 1928-45.

fatally. In the course of some months most patients develop ascites and oedema, and death takes place in hepatic coma. As a rule the liver is considerably shrunken, weighing 600-700 g., and its microscopical picture corresponds to a subacute atrophy. The most

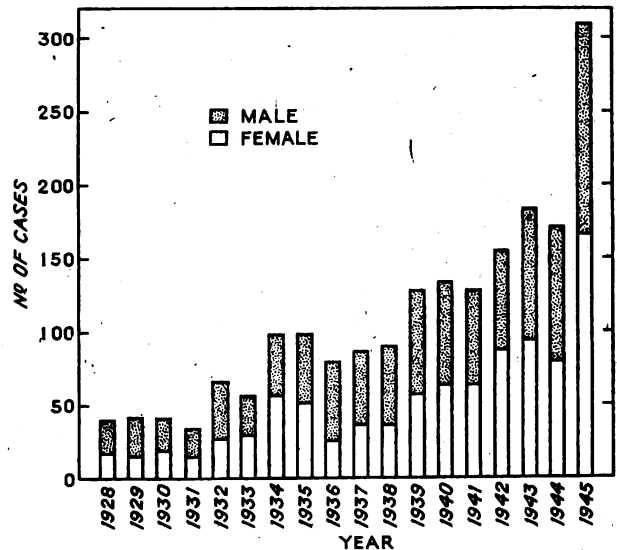


Fig. 2.—Incidence and sex-distribution of acute infective hepatitis (lasting less than 3 months) in three hospitals in Copenhagen in 1928-45.

curious feature of this malignant hepatitis is that it attacks almost exclusively women who have passed the menopause (Bjørneboe and Brøchner-Mortensen 1945, Jersild 1945, 1947, Alsted 1947).

Fig. 1 shows the notifications of infective hepatitis in Copenhagen in 1928-45 (this disease has been notifiable in Denmark since 1928). The curve shows a peak in 1934, and from 1940, especially from 1944, it rises rapidly. To obtain enough material on which to study the changes in the character of infective hepatitis we have examined the case-records at six medical departments of Copenhagen hospitals. During the period reviewed these six departments had 42-43% of the total medical beds in Copenhagen; hence the figures approximately reflect the incidence of infective hepatitis in the entire town. The case-records are divided into two groups—those in which the disease (from the onset of the icterus till recovery) lasted less than three months, and those in which it lasted over three months. The patients are regarded as cured when the visible jaundice, the lassitude, and the nausea have subsided. These two groups are called acute hepatitis and chronic hepatitis respectively.

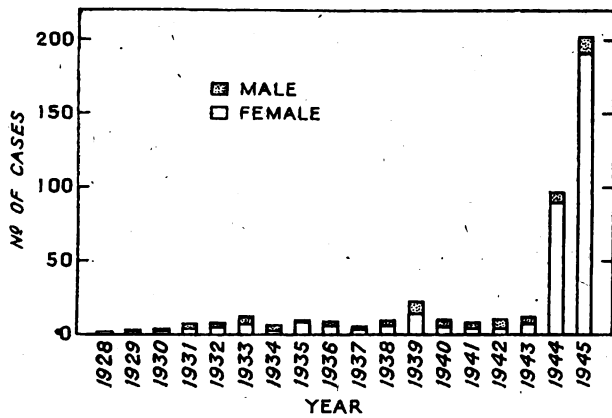


Fig. 3—Incidence and sex-distribution of chronic infective hepatitis (lasting more than 3 months) in three hospitals in Copenhagen in 1928-45.

**Sex-distribution.**—Fig. 2 shows the number and sex-distribution of patients with acute hepatitis admitted to these hospitals in 1928-45. An increase is observable from 40 in 1928 to 314 in 1945. The male : female ratio is 1 : 1 in all the years. Fig. 3 shows the number and sex-distribution of patients with chronic hepatitis at the same hospitals. Note the heavy increase in chronic cases in 1944-45, and the fact that the patients are almost exclusively female.

**Mortality.**—In 1928-45 a total of 229 patients at these hospitals died of hepatitis (the diagnosis in 211 cases was established post mortem). Table I shows the fatal cases, the overwhelming majority being women in 1944 and 1945. Comparing these figures with the number of notified cases of infective hepatitis in men and women in 1928-45 we see that among women the mortality from hepatitis rose considerably in 1944 and 1945. Table II shows the age-distribution of acute and

TABLE I—NOTIFICATIONS AND MORTALITY OF INFECTIVE HEPATITIS IN COPENHAGEN

Year	Notifications in adults in the whole city		Fatal cases in adults in 3 hospitals	
	Male	Female	Male	Female
1928	39	23	0	1
1929	97	64	2	1
1930	103	122	0	1
1931	148	98	1	1
1932	111	76	3	7
1933	108	89	6	7
1934	127	160	2	2
1935	91	139	2	4
1936	81	64	4	3
1937	78	91	3	2
1938	101	87	0	3
1939	105	138	3	5
1940	163	170	2	3
1941	290	253	1	4
1942	280	279	2	2
1943	417	417	2	8
1944	452	498	1	41
1945	943	761	4	98

Adults = more than 15 years old.

chronic hepatitis at the aforesaid hospitals in 1928-45. Between the acute and the chronic forms there is a difference in the age-distribution, 88% of the chronic cases being in patients over 40 years of age, whereas only 25% of the acute cases are in that group. The case-mortality among hospital patients with chronic hepatitis averaged 37% (table III), and a more detailed analysis has shown that in departments with a long period of observation of their patients the mortality is higher (up to 65%) than in those where the observation period is short.

DISCUSSION

The investigation shows that in Copenhagen in 1944 and 1945 there was a great increase in the number of cases of chronic hepatitis, and that this form of the disease has a high mortality. It might be thought that the cause was that in this group of the population hepatitis had become more frequent, and that this had involved a higher frequency of malignant cases, which always happens during epidemics. This is not so. An examination of the incidence of hepatitis in the various age-groups in Copenhagen in 1946 at any rate shows no particularly high frequency among elderly women (Ryssing 1948). Moreover, the mortality among women increased so much that we are constrained to assume that in women the disease actually has changed, becoming more malignant. We are unable to say why this is so. We know of nothing similar in other countries. It may be a question of a change in the resistance in this population group, or a change in the virulence

TABLE II—AGE-DISTRIBUTION OF INFECTIVE HEPATITIS IN THREE HOSPITALS IN COPENHAGEN, 1928-45.

Age (yr.)	No. of cases	
	Acute	Chronic
0-30	1080 (56.0%)	26 (6.1%)
31-40	370 (19.2%)	26 (6.1%)
41-50	216 (11.2%)	76 (17.8%)
> 50	264 (13.7%)	300 (70.0%)

TABLE III—MORTALITY OF INFECTIVE HEPATITIS IN THREE HOSPITALS IN COPENHAGEN

Type of disease	Cases	Deaths	Case-mortality %
Infective hepatitis 1928-45 .. .. .	2358	227	9.6
Chronic hepatitis (lasting more than 3 months) 1928-45 .. .. .	431	159	36.9
Chronic hepatitis (lasting more than 3 months) 1944 and 1945 .. .. .	305	116	38.0

of the hepatitis virus. For the present, however, all explanations of this kind can only be speculative.

SUMMARY

During an epidemic of infective hepatitis in Denmark beginning in 1941 a considerable number of cases with a protracted malignant course occurred in 1944 and 1945, especially in women past the menopause. At six municipal hospital departments in Copenhagen there were 303 cases with a course lasting more than three months. Of these, 97% were in women, and so far 37% have been fatal. The great majority of the patients were women aged over 40 years. Histological changes like those of subacute atrophy of the liver were observed. The course of the disease in most cases was characterised by protracted and often intermittent jaundice, oedema, and ascites.

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... there is reason to believe that the Minister's determination to advance the age at which this new examination can be taken is mainly intended to make it impossible for any child to take the examination from a secondary modern school, where few children will stay beyond the school leaving age. From this it follows that a 'General Certificate of Education,' to be awarded on a 'pass' in one subject (e.g., needlework?), can be obtained only by those children who are fortunate enough to be sent, at the age of 11, to a secondary grammar school."—Mr. JOHN HILLS, *Times*, May 28.



## THROMBOCYTOPENIC PURPURA DUE TO SENSITIVITY TO SEDORMID

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It is now 14 years since attention was first drawn by Loewy (1934) to thrombocytopenic purpura as a manifestation of sensitivity to the drug 'Sedormid' (allyl isopropyl acetyl carbamide). During that time many such illnesses have been described, and the following case does not differ from them in any important respect. It is recorded in deprecation of the fact that this potentially harmful drug, made up in tablets each containing gr. 4, is still too easily obtainable by the public.

### CASE-REPORT

An unmarried woman of 43, a secretary, was admitted to hospital on Feb. 20, 1947. She had felt well until Feb. 17, when she had passed blood in her urine. Twenty-four hours later she had had severe epistaxis. On the day of her admission she felt weak and ill, developed a husky voice, and noticed some bruising of her skin.

She had had rheumatic fever at 3 years, mitral stenosis since that time, and chorea at 17. From puberty she had been anæmic and had taken iron preparations at intervals. During the four months preceding her illness she had been taking sedormid gr. 4 three or four times a week, and this dose had been taken on each of the first two nights of her present illness. There was no personal or familial history of allergy or of blood disease other than anæmia. She kept house for her father, to whom she gave most of her meat ration, and she seldom ate vegetables or fruit.

**Examination.**—She looked thin, pale, and ill. Tongue moist and covered with petechiæ; voice weak and husky. Petechial hæmorrhages scattered all over trunk, limbs, and face; large ecchymoses about left orbit, left shoulder, and both ankles. Showers of petechiæ in buccal and conjunctival mucosæ. Urine resembled pure blood. Temperature 99°F, pulse-rate 90, respirations 20 per min. Blood-pressure 130/70. Tourniquet test strongly positive. Area of cardiac dullness enlarged to left, apex-beat being palpable in 5th intercostal space 1 in. outside midclavicular line. Faint systolic thrill at apex, where presystolic and systolic murmurs could be heard. No signs of cardiac failure, and no noteworthy findings in any other system.

**Blood Examination** (Feb. 20).—Hb 82%, red cells 4,200,000 per c.mm., white cells 4200 per c.mm., platelets 25,000 per c.mm., bleeding-time 15 min., clotting-time 30 min.

**Treatment and Course.**—On admission patient was given intramuscular ascorbic acid 500 mg. and calcium gluconate 10 ml. She was ordered vitamin P 150 mg. four times daily, calcium lactate gr. 7½ thrice daily, and a high calcium intake in her diet.

For eight hours after admission hæmaturia steadily increased; 10 ml. of blood from patient's antecubital vein was injected into the gluteal muscle. Hæmaturia diminished, and next day she felt considerably better. No fresh hæmorrhages were noted. By Feb. 25 all purpuric lesions were fading and urine was free from red cells on microscopical examination. Patient was now given ascorbic acid 50 mg. thrice daily with ferrous sulphate gr. 6. Intramuscular liver extract ('Plexan') 2 ml. was given on alternate days. This treatment was continued until she left hospital.

Further blood examination on Feb. 27 showed: Hb 72%, white cells 5400 per c.mm., platelets 224,000 per c.mm., bleeding-time 2½ min., clotting-time 8 min.

During the first ten days in hospital temperature varied between 98.4° and 99.8°F. Thereafter patient was afebrile. On March 6 she left hospital feeling well, being free from symptoms. Hb 100% on March 20. On May 1 patient was working full-time without any ill effect. She had had no further insomnia since leaving hospital and had therefore needed no hypnotics.

### DISCUSSION

McGovern and Wright (1939) noted that up to April, 1939, 44 cases of thrombocytopenic purpura caused by sensitivity to sedormid had been described. Falconer

and Schumacher (1940), reviewing 42 cases collected from the literature up to November, 1938, noted that sensitivity was higher among the older age-groups in both sexes. The platelet-count at the onset of the illness was, with two exceptions, below 80,000 per c.mm. In one of these, however, the platelets, which numbered 152,000 per c.mm. two days after the patient had taken half a tablet of sedormid, subsequently fell to 59,000 after a further tablet was taken. The white-cell count varied between 5000 and 20,000 per c.mm. Recovery was rapid as soon as the drug was discontinued: purpura and bleeding usually ceased in 8–10 days. Treatment with X rays, vitamin C, blood-transfusion, calcium, and liver did not hasten recovery.

The amount of sedormid necessary to cause sensitisation varies, but after sensitisation has occurred a very small amount—one or two tablets—will cause thrombocytopenic purpura. In the case observed by Falconer and Schumacher the patient was less sensitive to the drug a year after its withdrawal. During an attack of purpura their case showed a notable diminution in the number of megakaryocytes and platelets in the sternal marrow, but a normal number of primitive red cells and granular white cells.

It was suggested by Joekes (1938) and is now generally agreed that thrombocytopenic purpura occurs as a sign of idiosyncrasy to sedormid, which has a direct toxic action upon megakaryocytes; and in this action the carbamide radicle of the drug is probably important. The mechanism involved is of an allergic type, for purpura develops only in patients sensitised by previous ingestion of the drug. The sensitising dose may be small, as in the case reported by Huber (1939), when both sensitising and toxic doses were only two tablets, and recovery was not complete for 6 months. In one of McGovern and Wright's (1939) cases there were two separate episodes, the second one following the ingestion of half a tablet.

Since the bone-marrow has been established as the site of the toxic action of sedormid, it is unlikely that any pre-existing disease elsewhere in the body makes the patient more liable to develop signs of idiosyncrasy. The following diseases had existed previously in some of the recorded cases: asthma (Falconer and Schumacher 1940); tabes dorsalis, arthritis treated with T.A.B. vaccine, and duodenal ulcer (Hoffman et al. 1938); mild diabetes (Moody 1938). In the present case there was a rheumatic diathesis, with chronic anæmia, and a history of an inadequate diet; but the rapid and complete recovery after sedormid was withdrawn suggests that here, as in the other recorded cases, the only cause of thrombocytopenia was the drug.

### SUMMARY

A case is described of severe thrombocytopenic purpura due to sensitivity to sedormid. Complete clinical and hæmatological recovery took place a week after the drug was withdrawn.

During the past 14 years more than 40 cases of this toxic effect of sedormid have been reported. Caution should be exercised in prescribing this drug, and it ought not to be available to the public without a doctor's prescription.

My thanks are due to Dr. Octavia Wilberforce for permission to record this case, which was under her care, and to Dr. Mary Leslie-Smith for the pathological reports.

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## Reviews of Books

### Genetics in Relation to Clinical Medicine

F. A. E. CREW, M.D., F.R.S., professor of public health and social medicine, University of Edinburgh. Edinburgh: Oliver and Boyd. 1947. Pp. 111. 10s.

THE presentation of the whole of human genetics to medical men in six lectures is the task here undertaken with outstanding success. The title is slightly misleading, because the reader must not expect to learn any clinical medicine from the contents; but as a concise, accurate, and informative description of the biological elements of genetics and their relation to human heredity, this book has at present no competitor. The contrast between the purity and precision of genetic theory, based on experimental breeding of plants and animals, and the uncertainties which beset the genetic interpretation of human phenomena is thrown into relief by Professor Crew's treatment. Exact application of mendelism to man is possible in the field of serum antigens, but elsewhere multiple gene effects and modifications make several alternative explanations plausible for the same pedigree. Professor Crew is rightly dogmatic about genetic theory, but his account of the problems of hereditary disease in man is necessarily cautious and provides few details.

Some readers may be puzzled by the use of the term "dominance" in more than one sense. A dominant gene is spoken of in human genetics as one which produces an abnormal effect in the heterozygote—for example, the gene for Huntington's chorea: Incomplete dominance (p. 78) means that the homozygote is worse affected than the heterozygote. But perfect intermediacy (p. 84), a state of affairs implied by some theories of inheritance of metrical characters, is described as "absence of dominance" in the strictly genetic sense.

### Abnormal Psychology

*A Clinical Approach to Psychological Deviants.* JAMES D. PAGE, associate professor of psychology and director of the psychological clinic, Temple University, Philadelphia. New York and London: McGraw Hill. 1947. Pp. 441. 24s.

THIS is, in effect, a beginner's textbook of psychiatry written from a psychologist's point of view: the psychopathology, which the title might be supposed to indicate, is only a minor part of the book. The clinical material is adequate, without undue detail: the proportion between theory and practice is well balanced, and the presentation is clear and sober. The author documents his account with references to the current literature, and succeeds in incorporating a great deal of reliable recent work into his unpretentious text. It would be hard to name any work which one could so confidently put in the hands of a medical, psychological, or social student who wanted to find out, without much study, what psychiatry is now broadly concerned with. The book ends with a glossary, and a valuable list of films of psychiatric interest, with their running time, subject, and source.

### Annual Review of Microbiology

Vol. I, 1947. Editor: C. E. CLIFTON in association with S. RAFFEL and H. A. BARKER. Stanford, California: Annual Reviews. London: H. K. Lewis. 1947. Pp. 404. 36s.

MICROBIOLOGY, which so recently acquired a society and a journal in this country, can now boast an *Annual Review* from the United States.

Unfortunately, compared with such an undertaking as the *Annual Reports of the Progress of Chemistry*, which has appeared regularly since 1904, the organisers of the new review seem to have set themselves a less difficult standard of achievement: they do not intend to offer "exhaustive treatment of specific topics" but reviews which will be "critical appraisals rather than compilations." Is the antithesis real? Benedict and Langlykke's contribution on antibiotics is surely a compilation, and perhaps such compilation is the most suitable means of handling this subject at its present stage. Individually, many of the reviews are excellent, but similar articles are already to be found in *Bacteriological Reviews*. The need is rather for a well-indexed cross-section of current work—a set of annual reviews to which one can

turn, if one half-remembers a valuable reference of about 1946, with reasonable assurance that it will be in the *Review* published in 1947 or 1948. There is evidence from the present volume that this could be done. Gale's review, for example, is a model of its type: it covers the field indicated by its title of Nitrogen Metabolism, and after a brief historical and theoretical introduction it follows a logical sequence. In parts it is a compilation, where compilation of enzyme systems is necessary: but the data are also assessed from a physiological standpoint, when they are related to the functioning of such systems in vivo.

The wide selection of topics included in the volume deserves praise. From morphology, cytology, and systematics they range through nutrition, metabolism, and inhibitory agents to medical and industrial microbiology.

### Introduction to Physiology

W. H. NEWTON, M.D., D.Sc., Holt professor of physiology, University of Liverpool. London: E. Arnold. 1948. Pp. 284. 7s. 6d.

Professor Newton here undertakes the difficult task of satisfying the needs of the student beginning the study of physiology, and at the same time those of the layman. Clear, pleasantly written, and well illustrated, his book will bring home to the student, coming fresh to physiology, much that he would otherwise understand only after months of formal lectures, and it will help him to integrate the different aspects of the subject. The layman, on the other hand, may wish there were rather fewer facts.

### Gastritis

RUDOLF SCHINDLER, M.D., F.A.C.P., clinical professor of internal medicine (gastro-enterology), College of Medical Evangelists, Los Angeles. London: Heinemann Medical Books. 1947. Pp. 462. 50s.

Dr. Schindler began his pioneer work with the gastro-scope in 1920, and has continued his studies ever since—first at Munich and now at Los Angeles. His monograph is based on clinical and gastroscopic observations of more than 2500 cases. An account of his classification, and pathological and clinical sections, are followed by a summary of 55 selected cases with over 90 excellent photomicrographs of normal and abnormal gastric mucosa, and a dozen paintings of gastroscopic appearances.

Gastritis is a subject on which clinical opinion has swung between extremes: rapid post-mortem change makes it difficult to obtain really reliable autopsy specimens, and the limits of physiological alteration are not easy to determine. Schindler holds that chronic gastritis should be suspected in every patient with epigastric distress, and he sees a close connexion between atrophic gastritis and intense weakness and fatigue. On the whole he lays little emphasis on psychosomatic aspects, and he does not accept Hurst's view that every gastric carcinoma develops in the soil of chronic gastritis. His book presents his opinions with force and skill, and it is one that all gastro-enterologists will want to read.

**Thorndike English Dictionary** (London: English Universities Press. 1948. Pp. 1401. 15s.).—This is an English version of the American dictionary originally compiled by Dr. E. L. Thorndike, psychologist and educationist, on an ingenious plan. He and his associates recorded the number of occurrences of 20 million words in many English books and chose the 50,000 commonest for his dictionary. The different meanings of each word are also recorded in numerical order according to their frequency.

**Manual of Clinical Therapeutics** (2nd ed. London and Philadelphia: W. B. Saunders. 1948. Pp. 712. 25s.).—This book, though small, contains over 600 pages and offers easy and clear information. Prof. Windsor C. Cutting manages in the main to steer clear of vague generalisations and indefinite advice, and if he seems to proffer too many old and unnecessary medical clichés he also includes much of the latest work on such things as thiouracil, the anti-histamines, folic acid, and the new antimalarials. Penicillin and streptomycin are both fully and clearly described, and a practical account is given of methods of administration, uses, and dangers.

# THE LANCET

LONDON: SATURDAY, JUNE 5, 1948

## A New Beginning

WHEN the representative meeting of the British Medical Association assembled last week it was soon plain that its members' mood had changed since the previous gathering in March. All were conscious that they no longer met as a united body firm in opposition to an unacceptable health service and to an unrelenting Minister, and it was obvious that very many of them deplored this change and sought a scapegoat on whom to place the blame. Rejecting the council's opinion that the April plebiscite was necessary in order to estimate the effect of the Minister's concessions on medical opinion, they argued that the holding of this plebiscite was itself a factor in weakening the resistance of the profession. Accordingly, as the first major action of the day, they passed a resolution saying that the plebiscite was premature, that it indicated approval of the new conditions offered, and that it thereby prejudiced the voting.

The meeting then went on to consider what advice it should give to the profession. The council thought that doctors should now coöperate in the National Health Service on the understanding that the Minister would continue negotiation; but a great number of divisions had tabled amendments, ranging from total rejection to minor verbal alterations of the council's resolution. In the end the main debate took place on one from Kingston-on-Thames which proposed that coöperation should be deferred until all outstanding matters had been finally and concretely settled to the satisfaction of all sections of the profession. In the discussion on this proposal much information was given about the recent talks between representatives of the B.M.A. council and the Ministry of Health. As will be seen from Sir WILLIAM DOUGLAS's letter, summarised on p. 880, it has been agreed that the amending legislation shall permit local executive councils to elect their own chairmen, shall allow choice of the professional member of the tribunal from a panel of available members, and shall permit the local medical committees to meet their expenses (if so wished) from a statutory levy from the practitioners' remuneration. Other matters on which the Minister has consented to adapt his previous arrangements include a stipulation that doctors opting for a basic salary of £300 must submit their claim to the local executive council (which will consult the local medical committee before making its recommendation), and material modification of the regulations for the maternity service. It is clear that the amending Bill cannot be made law by July 5, but wherever necessary it will be retro-

spective. Similarly it has been decided that a temporary contract shall be offered to consultants and specialists and that this shall be revised retrospectively to July 5 when agreement has been reached on the report of the Spens Committee, which is expected this week. As far as the remuneration of general practitioners is concerned, it seems that the new scheme will now have to start under the conditions already suggested by the Minister, but the profession will be able to make representations to the Whitley Council on the shortcomings of the terms proposed.

Altogether the impression gained by the meeting was that much constructive negotiation was already going on, and that much could be done by its continuance. Should the Government go back on their promises, the profession could and would unite even more solidly than in February, and resign. As it was, even without awaiting the advice of the B.M.A. representative body, considerable numbers of general practitioners had already joined the service—26% of insurance practitioners in England, 37% in Wales, and 36% in Scotland. Many others were delaying only because they had been asked to defer action until after the representative meeting, and it was unreasonable to ask them to withhold their consent until final legislation was completed, perhaps several months hence. The profession should not concentrate on the few points on which it had not gained the day but on the many on which it had won from a Minister, ordinarily so uncompromising, such notable concessions.—These points, hammered home by Dr. DAIN, the chairman of council, and by several of the best-known and most trusted members of the representative body, eventually won the day. By a large majority the council's original recommendation was accepted unaltered, except that a rider was added to the effect that present coöperation does not preclude collective resignation later if the promised legislation is not satisfactorily concluded.

The representatives have gone back to their divisions, where doubtless they will have much to recount, perhaps some disgruntlement to assuage, and some difficult questions to answer. They will, we hope, recall particularly some words of Dr. JANET AITKEN, when she said that the profession cannot now prevent the new service coming into being on July 5 but may still prevent its efficient working. This, she believed, was a course it would never contemplate; if we are now to coöperate let us do so wholeheartedly.

## Structure of the Epidermis

Most histologists probably no longer regard the cellular composition of the epidermis as a live problem, however worried they may still be about the cellular anatomy of the nervous system and of some endocrine glands. The generally accepted view is that all the cells of the epidermis are derivatives by fission of parent cells of one uniform type—the germinative cells of the basal layer of the epidermis. These cells divide on the one hand to produce more germinative cells, and on the other hand to produce cells which, by their progressive degeneration accompanied by movement towards the skin surface, give rise to the stratification characteristic of the epidermis. It is not generally believed that cells of different

origin, structure, function, and lineage coexist with them in the epidermis, for otherwise they would reveal their presence in the ordinary transverse microtome sections on which the histologist has come, perhaps too exclusively, to rely.

Two papers by MASSON<sup>1</sup> and BILLINGHAM<sup>2</sup> make it clear that this orthodox view of epidermal structure is no longer acceptable. As long ago as 1868, LANGERHANS<sup>3</sup> showed that acid gold impregnation revealed cells of a new type in the epidermis—repeatedly branching cells, quite distinct from the other ingredients of the epidermis, and evenly distributed in such density that the territory covered by the branches of one such cell immediately adjoined the territory covered by the branches of its neighbours. Gold-impregnation methods are notoriously uncertain in their results; they are applied, to tissue squashes or teasings and not to sections. For these reasons, histologists have hesitated to acknowledge the cellular status of the cells LANGERHANS described. COWDRY,<sup>4</sup> in his standard textbook, does not believe them to be individual cells and doubts whether they have nuclei. But dermatologists<sup>5</sup> have in the main accepted LANGERHANS's findings, and have given his cells a royal christening: Langerhans cells, stellate cells, dendritic cells, *cellules amboceptrices*, "clear cells," melanoblasts, melanophores, and chromatophores are among the names that have been given to them, each one reflecting some aspect of the cells' real or supposed structure or function. BILLINGHAM and MASSON have now re-investigated the problem independently, using quite different techniques. BILLINGHAM uses living material, supravital staining with methylene-blue, and gold impregnation, and he has worked mostly with whole mounts and squashes rather than with sections. MASSON has relied on orthodox histological methods using alkaline silver impregnation. Their accounts agree in the following particulars. Dendritic cells occur in the basal layer of the epidermis, at the dermo-epidermal interface; their cell bodies are slightly larger than those of the ordinary "malpighian" cells round them, and have a more generous allowance of cytoplasm. The branches that arise from them weave with repeated dichotomisation between the cells about them, and each branch ends in a little end-button closely applied to the surface of a malpighian cell. Their cell bodies and the proximal ends of their branches can be identified in transverse sections stained by routine methods as the so-called clear cells already well known to histologists.

The dendritic cell is the only seat of pigmentary function in the epidermis. Malpighian cells contain pigment granules but do not manufacture them: BILLINGHAM's vital studies now finally make it clear that formed melanin granules are somehow passed from the branches of the dendritic cells into the cells on which the branches end. The malpighian cell therefore gets its melanin at second hand. MASSON comes to the same conclusion, and points out that when cells of different origin are given access to dendritic cells (as with gut epithelial cells in tumour metastases) they too may acquire pigment. Alone of

epidermal elements, the dendritic cell is "dopa-positive"—i.e., it gives the histochemical reaction thought to reveal the oxidases that transform dihydroxyphenylalanine into melanin. In negro skin, then, the dendritic cells can appropriately be called "melanoblasts." They are also melanoblasts in white human skin, barring the special case of albinos; indeed, MASSON's technique for showing them up turns on the fact that silver is deposited on and so "develops" pre-existing melanin granules. But the pigmentary function of white human skin is feeble and normally suppressed. Its dopa-reaction is correspondingly weak. Dendritic cells which completely lack pigmentary function, contain no trace of melanin, and fail to give the dopa-reaction are found in the white skin of spotted guineapigs. Ultraviolet light will soon bring colour to the "white" skin of human beings, but neither ultraviolet light nor any other physical or chemical stimulus will cause the non-pigmentary dendritic cells of spotted guineapigs to manufacture pigment. Their negative reaction to dopa suggests that the appropriate enzymic equipment is simply lacking.

BILLINGHAM figures successive division stages in living dendritic cells of guineapig's skin, and MASSON shows us a clear cell in the act of dividing. Dendritic cells therefore have a lineage or pedigree of their own: the old view that they are physiological variants of the malpighian cell can no longer be taken seriously. Not much can be said of their wider affinities. Similarity of structure, cell interrelationships, staining properties, and embryological origin suggest that dendritic cells are near cousins to some of the elements of neuroglia. For the entire tissue system of epidermal dendritic cells a new name is obviously required. The term "epidermal glial system"<sup>6</sup> is innocent enough etymologically, since "glial" carries the implication of glue and cohesion and not of association with the nervous system.

MASSON introduces one novel concept. He believes the dendritic cell to be squamous, in the sense that some of its division products pass up through the epidermal strata to be flaked off at the skin surface. In his opinion the cells revealed by LANGERHANS's acid gold impregnation do not belong to the basal layer, but are dendritic cells in process of being cast off.

From the pathologist's point of view, one property of dendritic cells is likely to prove outstanding. Dendritic cells may make the same sort of physiological contact with each other as each does individually with the malpighian cells within reach of its branches. Sometimes their processes are confluent, and sometimes an end-button from the branch of one dendritic cell applies itself to the cell body of another. What happens if a melanin-forming dendritic cell makes contact with a non-pigmentary dendritic cell, as happens at the margin of black and white areas in a spotted guineapig? It has been known for more than 50 years that in spotted guineapigs pigmentation does in fact slowly spread from black skin areas into white. BILLINGHAM and MEDAWAR<sup>7</sup> believe that this is due to the conversion

1. Masson, P. *Spec. Publ. N.Y. Acad. Sci.* 1948, 4, 15.

2. Billingham, R. E. *J. Anat., Lond.* 1948, 82, 93.

3. Langerhans, P. *Virchows Arch.* 1868, 44, 325.

4. Cowdry, E. V. *Textbook of Histology.* Philadelphia, 1938.

5. Cf. Becker, S. W. *Arch. Derm. Syph. N.Y.* 1927, 16, 259.

6. Billingham, R. E., Medawar, P. B. *Heredity*, 1948, 2 (in the press).

7. Billingham, R. E., Medawar, P. B. *Nature, Lond.* 1947, 159, 115; *Ibid.*, 160, 61.

of non-pigmentary dendritic cells into melanin-forming cells by contact with their melanin-forming neighbours. The transformation is permanent, and is such that a non-pigmentary cell, once converted to pigmentary function, can in its turn transform its non-pigmentary neighbours. The process is thus formally akin to a virus-induced cell transformation. Disregarding the relevance of this phenomenon to the problem of cell heredity, it is clear that it has an immediate bearing on the manner of spread of virus infections in the skin and on the type of concerted reaction by skin cells revealed by some forms of sensitivity. The greater part of skin histopathology has been worked out in ignorance or neglect of the existence of an epidermal glial system, and must now be revised accordingly. The urgent need at the moment is the development of simple and reliable techniques for showing up dendritic cells by ordinary straightforward histological methods.

### Sequels of Epidemic Jaundice

THE epidemics of jaundice during the late war were studied vigorously and taught us a great deal. It is now agreed that epidemic jaundice is a virus disease with an incubation period of 25-35 days, usually transmitted by faecal contamination of ingested food or water; and that there is a closely similar disease with a 3-month incubation period which is transmitted by an agent present in the serum of many people who themselves do not suffer from jaundice. Clinically the two are identical, but there is no cross-immunity between them. Biopsy methods have clarified the histology of the non-fatal forms, and it has been surprising to see how severe the liver damage can be in cases which subsequently recover, the liver returning completely to normal on further histological examination.<sup>1</sup> SHERLOCK<sup>2</sup> has also made careful assessment of the value of liver-function tests in diagnosis and prognosis, with biopsy controls.

It has been realised, especially in Scandinavia, thanks to the work of BERGSTRAND<sup>3</sup> in 1930, that there is a rising incidence of deaths from subacute necrosis and cirrhosis following an epidemic of hepatitis. Last week (p. 817) Dr. SHERLOCK reported on nine patients with such sequelæ, six following epidemic jaundice and three the "serum" variety. Two showed evidence of hepatic failure, from which one died, while four suffered from the effects of portal hypertension, two of them ending fatally with gastro-intestinal hæmorrhage. In the other three, however, the course has been less severe and the disease seems to have become chronic or even arrested; one patient recovered after having severe ascites which required tapping four times. Among the most ominous signs in a case of hepatitis is a persistent reversal of the albumin-globulin ratio, a point which the Oxford workers<sup>4</sup> emphasised some years ago. In this issue Dr. KING and his colleagues from Melbourne report the case of a young man who died of subacute hepatitis,

with biopsy studies as well as autopsy details. They emphasise one of the curious problems of this group—why should a virus infection turn into a chronic progressive disease? No other known virus infection runs such a course. In their case the patient's mother died of "alcoholic" cirrhosis and the histology of her liver was very similar to that of her son's. They suggest that the patient may have inherited some deficiency of the liver cells. Another explanation at which they hint is the possibility of an abnormal auto-antibody formation in these subjects. Some such mechanism may operate in the subjects of streptococcal infection who develop acute nephritis.

In BERGSTRAND'S original report a considerable number of cases developed the coarsely nodular type of lesion which may be called healed subacute necrosis. It is to be noted that SHERLOCK'S cases showed a finely granular cirrhosis or a histological picture practically indistinguishable from Laennec's cirrhosis. This seems to support the view of WATSON and HOFFBAUER<sup>5</sup> that epidemic hepatitis may be an important precursor of chronic cirrhosis. The apparently mild insidious, almost subclinical, hepatitis may be as important in the later production of cirrhosis as the clear-cut frank obvious attack of jaundice. The persistence of definite organic signs after an attack of acute hepatitis is a cause for anxiety and calls for a guarded prognosis, but symptoms alone, such as dyspepsia and vague upper abdominal discomfort, are not pathognomonic of persisting liver damage. SHERLOCK and WALSH<sup>6</sup> have shown that some patients with "liverish" symptoms after hepatitis probably have a "hepatic neurosis," somewhat analogous to the "effort syndrome" seen in patients who have had attention called to possible damage to their hearts.

Another facet of the same problem is illustrated by Dr. BJØRNEBOE and his colleagues on page 867. During 1944-45 Copenhagen had an epidemic of hepatitis with a particularly heavy incidence among people over 50. At this age men and women were equally affected, but whereas the men tended to recover in an ordinary manner the women often went on to a chronic form of the disease with a case-mortality of 37% in hospital, possibly reaching much higher figures under longer periods of observation. Whether this is the result of a heightened virulence of the virus affecting a part of the population who have outlived their immunity it is difficult to say. The high fatality-rate among women past the menopause seems to be a new observation, in which endocrine factors obviously may be involved. Whatever the explanation, we must recognise the unpredictable character of epidemic hepatitis. Fortunately in most epidemics the case-mortality is low—of the order of 1 in 500. But outbreaks of a more malignant type must be recognised as possibilities.

These papers are all useful reminders of the gravity of epidemic hepatitis. It is a condition which should never be taken lightly. Early rest in bed with a diet adequate in protein should be given, and a careful watch should be kept on all cases until the jaundice has completely subsided.

1. Dible, J. H., McMichael, J., Sherlock, S. P. V. *Lancet*, 1943, ii, 402.  
 2. Sherlock, S. P. V. *J. Path. Bact.* 1946, 58, 523.  
 3. Bergstrand, H. *Ueber die akute und chronische gelbe Leberatrophie*. Leipzig, 1930.  
 4. Higgins, G., O'Brien, J. R. P., Stewart, A., Witts, L. J. *Brit. med. J.* 1944, i, 211.

5. Watson, C. J., Hoffbauer, F. W. *Ann. intern. Med.* 1946, 25, 195.  
 6. Sherlock, S., Walshe, V. *Lancet*, 1946, ii, 482.

## Annotations

## SICKLING RAPIDLY DETECTED

IN America and West Africa sickle-cell disease occurs among the Negro population and among those with Negro ancestry. The severe hæmolytic anæmia that the term sickle-cell disease calls to mind is easy to detect. But sicklæmia also causes thrombosis in many places, which may be very puzzling because the presenting clinical picture may be a cardiac or nervous-system disturbance or an odd skin lesion, or it may mimic rheumatism, tuberculosis, or even an acute abdominal emergency for which the normal treatment would be surgery. These deceiving syndromes may appear in people who have the sickle-cell trait but have no anæmia. In the parts of the world where sicklæmia is endemic, the rapid detection or exclusion of red-cell sickling is therefore of great practical importance.

Tests for the presence of the sickling phenomenon depend on the fact that the typical deformity of the red cells only appears when the oxygen tension in the blood sample is sufficiently reduced. The obvious way to test for sickling is therefore to put a drop of blood under a coverslip, seal it with soft paraffin, put it in the incubator at 37°C and inspect it every now and then. But the time taken for the oxygen tension to be reduced sufficiently varies greatly since it depends on the presence of oxygen-consuming cells like granulocytes and normoblasts; it is thus not surprising that sickling may only appear after 48-72 hours. Various techniques have been devised to overcome this difficulty and obtain a rapid answer. Diggs and Pettit<sup>1</sup> compared all the techniques suggested up to 1940 and recommended that of Scriver and Waugh.<sup>2</sup> This technique is simply to produce stasis by constricting a finger for 5 minutes, then to puncture the finger and transfer a drop of the dark blood as quickly as possible to a slide, sealing under a coverslip and incubating as before. This gives better results, but it is not easy to avoid a variable reoxygenation while the manipulations are going on.

Singer and Robin<sup>3</sup> have introduced a new test. The principle is to use a suspension of non-pathogenic bacteria as a diluting fluid for the blood to be tested; the bacteria rapidly consume oxygen and give off CO<sub>2</sub> and so quickly create optimal conditions for the development of sickling. With this technique it is possible to induce sickling of susceptible cells within 15 min. at the most. They selected *B. subtilis* as a suitable organism, but *Bact. coli* and *Aerobacter aerogenes* are equally effective. The cultures must be fresh because in old cultures the bacteria are sluggish and do not absorb oxygen rapidly enough. This is the only difficulty of their test; it is necessary to have available a properly perpetuated culture, and in practice this means that daily subcultures must be made if an active bacterial reagent is to be ready when needed. If the laboratory has a large demand for sickling tests this condition is no hardship: The test itself is quite simple. A drop of blood and a drop of bacterial culture are mixed on a slide and covered with a coverslip; air-bubbles are excluded, the preparation is sealed and placed in the incubator at 37°C for 5 min. If no sickling is seen the slide is replaced for another 10 min. and if no typically deformed red cells are present after that the result can safely be reported as negative.

An important application of this rapid test has been in the selection of blood donors. People whose red cells show the sickling trait are generally considered unsuitable. But a few experiments reported by Singer and Robin suggest that red cells showing the trait survive as well as normal cells—for 100-120 days; so it may not be necessary to reject these people as blood donors, though clearly their peculiarity needs to be known.

## EPHEDRINE AS SPINAL ANÆSTHETIC

EPHEDRINE is as indispensable to the spinal anæsthetist as it is to the rhinologist. Beyond its vasopressor and vasoconstrictor actions little was known of any other pharmacological effects until Shultz<sup>1</sup> in 1940 reported that ephedrine produces analgesia when it is injected subcutaneously. This was carried further in frogs by the observation that subarachnoid injection of ephedrine produced spinal analgesia. The local analgesic property of ephedrine helps to explain the potentiating effect of ephedrine when injected simultaneously with spinal anæsthetics. Jianu and Moisescu<sup>2</sup> first observed the potentiation in 1933 and since then ephedrine has been commonly added to spinal analgesic solutions for this purpose. Until the work of Shultz it was assumed that any potentiation produced was secondary to the vasoconstriction. The results of Shultz in the frog have now been confirmed in man by Ruben et al.,<sup>3</sup> who actually operated under the spinal analgesia produced by the intrathecal injection of 50 mg. of ephedrine. This injection had no effect on the blood-pressure or for that matter on the rest of the body, suggesting that only a negligible quantity was absorbed into the circulation. It seems useless therefore to give ephedrine intrathecally for its vasopressor action. Its anæsthetic effect, however, should be borne in mind, and mixtures of ephedrine and spinal anæsthetic should be injected only after suitable adjustment of the dose of the main agent.

## EARLY DIAGNOSIS OF CEREBRAL PALSY

SUCCESSFUL treatment of children with cerebral palsy largely depends on an early start. Speaking to the Physiotherapy Association at the Radcliffe Infirmary, Oxford, on May 21, Mrs. Eirene Collis, of the London County Council cerebral-palsy unit at Carshalton, discussed the points on which a diagnosis may sometimes be made during the first year. Normal motor activity moulds bones and develops muscle balance, and if motor activity is restricted or bizarre then deformities, speech defects, and facial grimaces will appear as time goes on. Before these have appeared, however, it often needs close observation to detect the motor disability. Athetosis can mimic the early incoördinate movements of the normal infant, and the mother who surmises that movement is limited may have difficulty in demonstrating it to the doctor until the child's faulty motor habits have already produced deformities. A baby who can bring his hands before his face in the course of an athetoid movement may not be able to perform the same gesture voluntarily. That means he cannot get things into his mouth to suck, and he will not be able to watch the movements of his fingers; he will thus be deprived of a large part of his motor education, and as a result will begin the long build-up of bad habit which at last produces gross deformity. He is deprived, through life, of the ordinary education afforded by normal use of eyes, tongue, palmar and plantar surfaces, exercise of the whole body, and the interaction between movement and thought, which have become second nature to the rest of us.

Early diagnosis, then, must be based on close observation of motor behaviour. The severe case with fits is easy to detect, but since the prognosis in diffuse cerebral damage is poor, attention is better directed to children who have suffered birth injury or asphyxia but who never develop fits and who seem to have recovered. If such a baby has difficulty in sucking, or is otherwise a nursing problem; if later he does not suck his fingers as normal babies do; if after the age of four months his head lolls or is retracted or held forward—then he should be examined and watched. His xiphisterum may be

1. Shultz, F. H. *Anesthesiology*, 1940, 1, 69.
2. Jianu, A., Moisescu, V. *Z. Chir.*, 1933, 60, 1166.
3. Ruben, J. E., Kamler, P.M., Howell, W. L. *Science*, 1948, 107, 223.

1. Diggs, L. W., Pettit, V. D. *J. Lab. clin. Med.* 1940, 25, 1106.  
2. Scriver, J. B., Waugh, T. R. *Canad. med. Ass. J.* 1930, 23, 375.  
3. Singer, K., Robin, S. *J. Amer. med. Ass.* 1948, 136, 1021.

depressed, and the pelvis will be tilted down in front and up behind; this prevents him from sitting squarely on his tuber ischii, and by the time he is a year old he will have flattening of the gluteal folds and a transverse crease from one side of the abdomen to the other. Even before he tries to sit up, the abdominal muscles will be stretched by the tilting of the pelvis, and the distance between his xiphisternum and his symphysis pubis will be longer than usual—a deformity also found in rickets. The normal baby is continually changing the position of the parts which make up the whole infant. The baby who will later be diagnosed as spastic is apt to be rather a still and eventually a stiff baby. The athetoid, on the other hand, instead of being a quiet all-in-one-piece baby may appear to be normally active, though careful observation will show his activity is inadequately controlled for his stage of development. In cerebral palsy every disability contributes to another which derives from it, and the result is cumulative. Mrs. Collis thinks that if the diagnosis could be made early enough the child could be taught to move normally before deformity, and the educational retardation which goes with it, had time to develop.

### ENROLLED AND REGISTERED

IN presenting their comments<sup>1</sup> on the report of the Working Party on the recruitment and training of nurses, the council of the British Medical Association promised us constructive proposals for an alternative scheme of training. These proposals now appear in a joint memorandum<sup>2</sup> by the B.M.A., the British Hospitals' Association, and the Medical Superintendents' Society. The three bodies begin by describing the Working Party's plan as impracticable, even as a long-term policy, and in particular they disagree with the Working Party's conception of the student nurse. Nursing, they affirm, is essentially a practical occupation, and training should be largely an apprenticeship. While the ward work of the student nurse should not be subordinated to the needs of the hospital, her status cannot be completely that of a student.

The authors of the memorandum consider that two main problems must be solved if enough nurses are to be recruited. The first, the problem of the gap, they would try to solve by making every girl take a preclinical course. Those who remained at school would take a two-year course from the age of 16 as part of their general education, while those who had jobs could have similar instruction at evening classes. In an addendum the British Hospitals' Association makes a special plea for schemes whereby girls could combine partial employment in day nurseries, clinics, and nursery schools with continuation of their general education and preclinical training. There would also be a short whole-time preclinical course which could be taken in 16-23 weeks in training units within the hospital system.

The problem of the assistant nurse is dealt with in the memorandum by giving her the title of "enrolled nurse," which she would attain after a two-year course in practical nursing. The preclinical course and this two-year course would be taken by all entrants to the nursing profession, and the knowledge that she has started "along the same road as her more gifted sister, and is accorded a definite professional status even should she decide not to go all the way" would give the enrolled nurse a due sense of the dignity of her calling; she would know that she was indeed a nurse and not merely some sort of inferior substitute. A third year of training, in which more advanced theoretical instruction would be combined with a wider range of practical work, would lead to State registration, and there would then be a final stage of postregistration diploma courses for those

who wished to specialise. According to these proposals every State-registered nurse would first have to qualify as an enrolled nurse, and every enrolled nurse would have the chance of becoming a State-registered nurse. (The only exception to this rule would be the continuation of a certificate in tuberculosis nursing, which it is suggested should remain open to girls who through physical incapacity are unable to take the general training.)

Whereas the Working Party scheme would provide a small body of nurses, all State-registered, who would have to be reinforced by a host of nursing orderlies, this plan is intended to produce a larger body of nurses, all of whom have had a preclinical course and at least two years' training. We feel sure that this is the sounder policy.

### POLYMYXIN AND AEROSPORIN

AT one time it seemed likely that the two antibiotics polymyxin and aerosporin would prove to be identical, but it is now clear that they are distinct though related more or less as are the different penicillins. Both are active against many gram-negative organisms not much affected by other antibiotics, including *Bact. coli*, *H. pertussis*, *B. aerogenes*, *Br. abortus*, and some varieties of salmonella and shigella.

The production, isolation, and preliminary characterisation of polymyxin were described nearly a year ago by Stansly and colleagues,<sup>1</sup> of Johns Hopkins, who obtained it from the fermentation liquor of *B. polymyxa*, a soil organism. In further experimental and clinical investigations, Schoenbach et al.,<sup>2</sup> also of Johns Hopkins, have shown that it is active against gram-negative organisms in the presence of serum and that it does not give rise to resistant strains like streptomycin. This is also true of aerosporin. Unfortunately, the toxicity of both these antibiotics is considerably greater than that of penicillin or even of streptomycin. In the control of experimental infections in mice with *K. pneumoniae* and Pfeiffer's bacillus, polymyxin appeared to be five to ten times as effective as streptomycin. In total daily doses of 5 mg. per kg. of body-weight, given at intervals of three hours, polymyxin has been used to treat patients infected with *Ps. pyocyanea*, *K. pneumoniae*, *H. pertussis*, and *Br. abortus*. The antibiotic certainly has a therapeutic effect, but too few patients have been treated for its clinical value to be appraised.

Aerosporin, which has been studied in this country by a group at the Wellcome Physiological Laboratories,<sup>3,4</sup> is derived from an aerobic spore-bearing bacillus identified as *B. aerosporus* Greer, which may be identical with *B. polymyxa*. Aerosporin and polymyxin both appear to be basic polypeptides, but they give different products on acid hydrolysis. Aerosporin yields the amino-acids leucine, threonine, and  $\alpha$ -diaminobutyric acid, whereas polymyxin yields serine on hydrolysis. Neither antibiotic penetrates the blood-brain barrier. The earlier trials with aerosporin showed that it contained a factor which damages the renal tubules, and this was a serious obstacle to its clinical use. More recently, however, aerosporin free from any nephrotoxic action has been isolated from a special strain of *B. aerosporus*, and clinical trials with this are in progress. Swift's preliminary report on the treatment of pertussis with aerosporin<sup>5</sup> suggested that it does good if given early enough. This agreed with the report of Brownlee and Bushby<sup>4</sup> that a single dose of the antibiotic protected 90% of animals experimentally infected with many lethal doses of *H. pertussis*. In the treatment of pertussis aerosporin

1. Stansly, P. G., Shepherd, R. G., White, H. J. *Bull. Johns Hopk. Hosp.* 1947, 81, 43.
2. Schoenbach, E. B., Bryer, M. S., Bliss, E. A., Long, P. H. *J. Amer. med. Ass.* 1948, 136, 1096.
3. Ainsworth, G. C., Brown, A. M., Brownlee, G. *Nature, Lond.* 1947, 160, 263.
4. Brownlee, G., Bushby, S. R. M. *Lancet*, Jan. 24, p. 127.
5. Swift, P. N. *Ibid.*, p. 133.

1. *Brit. med. J.*, April 10, suppl., pp. 80 and 97. See *Lancet*, April 17, p. 605.

2. *Brit. med. J.*, May 29, suppl., p. 139.

has the disadvantage that it must be administered parenterally every four hours, which is trying not only for the patient but also for the nurse or doctor.

Both polymyxin and aerosporin are still in the clinical trial stage and are not yet obtainable for general use.

#### ANTI-ANÆMIC SUBSTANCES FROM LIVER

CONTINUING the work reviewed in our leading article of May 8, Mr. E. Lester Smith, D.Sc., of Glaxo Laboratories, has crystallised the anti-pernicious-anæmia factor which he has isolated from liver. In a report to the Biochemical Society's meeting last Saturday, he said that the crystals obtained resemble those of vitamin B<sub>12</sub> as illustrated by the American workers,<sup>1</sup> and that calculations from colour intensity suggest a minimum effective dose of the same order.

#### THE YOUTH MOVEMENT

P.E.P. have published a useful survey<sup>2</sup> of youth services as they were before the war and are now. These services have grown rapidly and are probably still growing, though not as fast as they were in war-time. In 1939 there were about two dozen well-known national youth organisations, half of them dating back to the last century. They included, among statutory institutions, the day continuation schools, the junior instruction centres, and the evening institutes and classes. Under the Education Act of 1918, local authorities were empowered—but not obliged—to set up day continuation schools and to make part-time attendance compulsory for young people under eighteen who had left school; and by 1937 some 19,000 were attending. In 1946 the numbers had risen to about 30,000. Junior instruction centres ("dole schools") were set up between the wars for unemployed boys and girls, and attendance was compulsory for those who claimed unemployment benefit or were registered as unemployed. Though staffing and equipment were inadequate, some young people who were not claiming benefit attended voluntarily. In 1937 there were 20,000 attending. Some attempts to coördinate voluntary youth organisations and statutory services—notably the juvenile organisations committees—fell flat, and so did the National Fitness Council which savoured too much of Continental youth movements to be acceptable.

The Board of Education circular, "The Service of Youth," which appeared in 1939, and the Education Act of 1944, set new developments on foot. The Act obliged local authorities to undertake some duties which had formerly been optional, and Government financial help was offered to almost every type of responsible youth organisation. The aim of the new service is to bring statutory and voluntary organisations into partnership, and to encourage voluntary national service and the better use of leisure. It was built up entirely during the war, and has much the same pattern in all areas, though names and details vary. The county and county-borough youth committees are in touch with district youth committees and with youth councils appointed by the young people themselves. Local youth organisations are represented on the youth committees of the local education authority, and youth organisers and leaders are attached to the authority's staff. The youth councils have proved particularly successful, for though they are purely advisory they help to introduce young people to local government, and local government to young people. Both learn.

On the voluntary side there is a consultative body, the Standing Conference of National Voluntary Youth Organisations (S.C.N.V.Y.O.), representing 21 constituent organisations, with a membership of 998,000 children

under fourteen, 809,000 young people between fourteen and twenty, and 105,000 leaders. There are also area associations of the national voluntary bodies, often with an area organiser; these arrange holidays, conferences, tournaments, and international contacts. Unfortunately area associations are not always welcome to local authorities, who may withhold grants-in-aid. One cause of friction is the flexible boundary of the area association as compared with the fixed territory of the authority. Voluntary organisations include those of religious bodies, as well as such undenominational movements as the Girls' Friendly Society and the Y.M.C.A.; the youth units set up by the Fighting Services; the Scout and Guide movements; the Red Cross and Order of St. John, which provide specialised training for young people; and the youth movements of political parties. Most of these emphasise the importance of self-discipline, of service to others, and of education.

"The education authorities," P.E.P. note, "have increasingly adapted their wares to the tastes of young people." Thus many evening institutes, particularly those of the L.C.C., are largely recreational. Moreover, club activities have been added to class work, and special classes arranged at youth units. P.E.P. feel it is a great democratic achievement to have established a system under which most units, though their control is independent, turn easily and naturally to the local authority for assistance.

The service is far from perfect: equipment is scarce, leaders are few and underpaid, collaboration between voluntary bodies and local authorities is not always easy, and traditions are sometimes so purely recreational as to waste the young people's time and opportunities. But here at least is a framework which can be developed, and the means to give young people a grounding in those civil purposes and manners on which a healthy society must be built.

#### VETERINARY SURGEONS AND PRACTITIONERS

THE Veterinary Surgeons Bill, which has passed the committee stage in the House of Lords and went to the Commons this week, restricts the practice of veterinary surgery (except for certain common minor operations) to qualified persons; but existing practitioners will continue to practise under the title of "veterinary practitioner"—a name which the profession accepted only with difficulty. Under the Veterinary Surgeons Act of 1881 all students have had to pass an external examination conducted by the Royal College of Veterinary Surgeons, and this one-portal system has done much to raise and unify standards at the five veterinary colleges. But it has been increasingly felt that this system is outmoded and that the veterinary education should be brought into closer touch with the universities. Under the present Bill certain approved universities will be given the power to grant degrees in veterinary science, and the graduate will be entitled to registration as an M.R.C.V.S., which will qualify him for practice. The Royal College will retain powers of inspection as to veterinary matters in universities granting a veterinary degree and may make representations to the Privy Council if it believes that teaching at any university is unsatisfactory. In order to carry out its new duties the council of the college, which is now formed entirely of elected veterinary surgeons, will in future consist of 20 elected veterinary surgeons, 4 persons appointed by the Privy Council, and 2 persons (one of whom shall be a veterinary surgeon) appointed by each university granting a veterinary degree. It is proposed that the present colleges at Glasgow, Edinburgh, and London shall be incorporated in their respective universities. Liverpool already has a veterinary school and Cambridge and Bristol are about to establish schools of veterinary medicine.

1. *Chem. Engng News*, 1948, 26, 1304.

2. *Planning*, 1948, 14, no. 280. From Political and Economic Planning, 16, Queen Anne's Gate, London, S.W.1.



## Special Articles

### SERVICE UNDER THE ACT

#### B.M.A. REPRESENTATIVE MEETING

THE representative body of the British Medical Association met in London on May 28, under the chairmanship of Dr. J. B. MILLER, to consider the results of the latest plebiscite on the National Health Service, and the council's recommendations.

The meeting spent some time in debating whether motions of censure on the council should be taken first; finally it was decided, by 175 votes to 110, that these motions should be considered after the first of the council's recommendations had been put to the meeting. An East Yorkshire motion calling for information on how individual members of the council voted in "the precipitate April plebiscite" was rejected.

#### REPORT BY CHAIRMAN OF COUNCIL

Dr. H. GUY DAIN, chairman of council, said that the policy had been to place on individual doctors responsibility for deciding whether to enter the service; thus a plebiscite had been necessary from time to time. In the last 4-5 years the position had changed continually. In February the Minister of Health was still refusing to make any change in the National Health Service Act; and doctors voted 10 to 1 against the Act, and 6 to 1 against taking service. The Minister then made a statement in which he promised to limit his powers in several directions: there was to be no whole-time service except by further legislation; a legal committee was to be set up to consider the disputed position of partners; the basic salary was to become optional; and there was to be free speech, including free criticism of the service.

The council met and devised a series of questions, the answers to which supplied further information about the position of specialists and consultants, and of hospitals. In these answers the Minister gave an assurance that medical members of management committees should be full members; and he agreed that all regulations should be submitted in draft to the association, for comment. The council met again but was not unanimous. It drew up a report explaining the position fairly to doctors, and asking them not to accept service until the representative body had reached a decision. The council did not assume responsibility for the final decision about entry into the service.

The council had been criticised for the speed with which the plebiscite was held; but the issue had been so long under discussion that there was no need to allow further time. It had been decided a long time ago that the profession should not be asked to withhold service unless at least 13,000 general practitioners favoured this action; and in the latest plebiscite only 9500 practitioners voted for this course. The representative body had, however, been placed in a difficult position; for there were still substantial majorities in disfavour of the Act.

#### CRITICISM OF PLEBISCITE

Dr. MONA MACNAUGHTON (Newcastle-on-Tyne) put this motion:

That the council's action in calling for a third plebiscite so quickly after the second one was premature, and indicated approval of the new conditions which had been offered, and prejudiced the voting. The meeting considers that such a step should not have been taken except by a decision of a special representative meeting.

On April 14, said Dr. MacNaughton, the council for the first time took the responsibility for holding a plebiscite; and by April 19 the papers were in the hands of doctors. Only ten days were allowed for their completion, so there was little time to get around and

talk to practitioners. The decision had been made by the same leading officers who had said that the association must abide by certain principles; and the Minister had given way on only one of these. Most doctors thought that this further plebiscite meant that the council agreed that it had got all that it was going to get; the only lead was in one casual sentence in the document which accompanied the plebiscite paper.

Dr. H. H. GOODMAN (Newcastle-on-Tyne) complained that the plebiscite was a tactical error, unjustified by the Minister's immediate concessions. The disunity in the council was reflected in the voting; the plebiscite had split the profession more effectively than the Minister ever could. Thus the council had lost its impregnable position. "We feel that the action of the council was precipitate, unnecessary, and *ultra vires*."

Dr. J. C. ARTHUR (Gateshead) maintained that a hasty plebiscite would have been justified only if (1) the profession was fully informed about the position, and (2) the council was aware of a dramatic change in professional opinion. Neither of these conditions had been satisfied; and simply by holding a plebiscite the council had suggested that the position had changed greatly. Perhaps it had been influenced by the reluctance of practitioners to subscribe to the Independence Fund the £100 which had been asked of them; but this was a false criterion.

Dr. I. G. INNES (East Yorks) likened the situation to that after the battle of Prestonpans: "We seem to have run away and lost all our gains." The plebiscite result did not, in his view, truly represent opinion.

Mr. N. ROSS SMITH (Bournemouth) held that the council's action was "a failure of duty and a tactical blunder." Nothing could so completely have undermined the strong position of February as a plebiscite on partial concessions. The Government should have been informed that the association's points had not been covered. Was the plebiscite simply a blunder or had the majority of the council decided to cease opposition to the Act? That the second was the true explanation was suggested by the premature announcement of the plebiscite, the form itself, the cessation of activities by the public-relations department and the Independence Fund, statements by spokesmen and officials that great advances had been made, the tone of editorials in the *British Medical Journal*, and finally the council's recommendations announced three weeks before the representatives met.

Dr. P. J. GIBBONS (Liverpool) had been in favour of the latest plebiscite because of talks he had with doctors in his own area and because he was impressed with the poor response to the appeal for contributions to the Independence Fund. The council was entitled to know how feeling had changed; and a plebiscite was the only method of finding this out.

Dr. E. A. GREGG (St. Pancras) said that the holding of a plebiscite was the only wise course open to the council. He was disappointed with the result; but he was glad to know it. Just before the plebiscite every post office was filled with a mass of literature, to be distributed among householders, encouraging the public to besiege doctors with requests to be accepted as patients under the Act; similarly, doctors were about to be asked to take service. It was essential to discover the profession's opinion.

The Newcastle motion was carried by 167 votes to 148.

#### ADVICE TO THE PROFESSION

For the council, Dr. DAIN moved the following resolution:

That, despite the insufficiency of the safeguards to the profession's freedoms and the misgivings of a substantial section of the profession, the representative body, anxious as ever that in the public interest a comprehensive health service should be made available to the community, is prepared to advise the profession to cooperate in the

new service on the understanding that the Minister will continue negotiations on outstanding matters, including terms and conditions of service for consultants and specialists, general practitioners, public-health officers, and others.

The necessary majority, Dr. Dain said, had not been attained in the plebiscite; so in view of its previous pledge the representative body was not free to advise continued opposition. The profession's coöperation must depend on further consideration by the Minister of points which had not been offered up to now. The council had thought it wise to inform the Minister that there was still grave dissatisfaction in the profession; and as a result a letter had been received from Sir William Douglas (see p. 880).

The Council's resolution had definitely said that the profession was not sufficiently safeguarded. The council had been accused of giving way; but he denied that it had committed the profession to entering the service. Dr. Dain had been dissatisfied with the terms suggested by the Minister until very lately when progress had been made. The Minister had not been persuaded on the issue of direction; but practitioners would be free to practise wherever they wished except in the few overdoctored areas, which were to be named by the Medical Practices Committee. As regards consultants and specialists, the position had improved; for them forms of provisional contract were now being prepared. The Spens committee report on specialists' pay was expected to appear on June 9; and until the terms of this report could be applied specialists would receive payment on account.

On the issue of the buying and selling of practices it was important to recall that no political party had supported the association's claim; but, though no money was to pass, the Minister had assured the freedom which it had been feared would be lost if buying and selling ceased. The conditions in the midwifery service had been improved; any doctor, whether or not he was on the list of approved practitioners, was now free to attend his own State patient at a confinement, if both he and the patient wished. The Minister had agreed that the £66 million to compensate for loss of goodwill should be proportionately increased if substantially more than 17,900 doctors entered the service. He had agreed, too, that as soon as the service started the association should be free to raise with the appropriate Whitley council questions as to the amount of the betterment factor in implementation of the Spens report on general practitioners' remuneration. Thus every point except goodwill had been either won or overcome; and he was satisfied that the modifications made in the last few weeks provided all the necessary safeguards.

It was now impossible to continue open battle. The points that had not been conceded were important; but were they important enough to prevent the profession from taking part in the service? In 1911 and for some time after, there was a great split in the profession, which was not foreseen; the need now was for foresight. The cleavage was one between those satisfied with the position and those who were opposed to any service at all; and it remained the association's duty to protect those who did not want to enter the service. Dr. Dain concluded with an appeal to representatives not to speak forcibly for or against the council's action unless they had been briefed by a majority of their division. Since the plebiscite many divisional meetings had been poorly attended; and in Dr. Dain's division a ballot of all members had revealed a substantial majority in support of the council.

#### DELAYING THE DECISION

Dr. T. W. MORGAN (Kingston-on-Thames) put forward an amendment suggesting that the representative body was prepared to advise coöperation in the new service

only if the results of continued discussion on outstanding matters were concrete, detailed, and acceptable to all sections of the profession. Doctors, said Dr. Morgan, were being asked to enter a service of which they knew very little. So far as principles were concerned, it seemed that the profession could enter with a fairly easy conscience. But it was also necessary to know the terms and conditions of service; and to specialists these were quite unknown. In announcing his concessions, the Minister did not seem to have the support of Government back-benchers; and his concessions should be assured before the profession committed itself for good and all.

Dr. J. KENNEDY (Hampstead) suggested that practitioners were in an unfortunate position; the Minister was saying that they were free to enter the service or not, as they wished; but those who did not enter would receive no compensation. It was a case of "sign or starve." The practitioner would be required to work seven days a week, and twenty-four hours in each day, without holidays with pay; and their houses were to be used without compensation. What would a miner, a docker, or a transport worker think of such terms? For fair play the sooner a trade union was formed the better.

Lord HORDER (Marylebone) accused Dr. Dain of inconsistency: while the plebiscite was being held he had told doctors that they had the opportunity of standing fast with the position taken up at the previous plebiscite; and yet three days later, in a letter to the *British Medical Journal*, he said that his speech had caused misunderstanding and that the position was changed. The precipitancy of the plebiscite suggested that the Minister's offer was of great importance. What happened during those three fateful days? There was no doubt in Lord Horder's mind that the change in the chairman's attitude caused doubt and confusion. He had not been cheered when Dr. Dain said that the profession were all together. It would not help if they were all together when the ship sank: "I'd rather be alone and swim."

When had the rot set in? Dr. Dain had said only that the situation was changed; but others had said that this was a famous victory. What was this victory—"an assurance by the Minister that we should not lose our liberty all at once"? The burning question was whether the present situation could be retrieved. "We feel that it can be retrieved. . . . The men and women who are signing on daily are signing on for economic reasons and through fear of loss of compensation. They should be told what will-o'-the-wisp it is they are following and how uneconomical their new venture really is." The position of the consultants was worse, for they did not know the terms of service. The job of the council and the secretariat was to explain all this to doctors. If the council had lost heart and become defeatist it could not do its work, aimed at redeeming the situation, which was now really pathetic. "We do feel that the council has acted—and in this set of resolutions is proposing to act—past their mandate." The council had a mandate not to advise withholding of service in the event of fewer than 13,000 practitioners expressing willingness to do so; but it had no mandate to advise entry into the service. The resistance of a large number to the present official attitude would continue and would grow. Lord Horder appealed for a solid front inspired by the same spirit which had prevailed last February.

Mr. R. L. NEWELL (council) had supported an immediate plebiscite because he was aware that opinion had changed. "I admire very greatly Lord Horder's clinical acumen; but I fear his diagnosis has been warped by the acute symptoms developed in Marylebone." After the Minister's statement contributions to the Independent Fund fell away; doctors were signing up,

and if the council had advised a continuance of the fight without getting the facts many doctors would have been found in the service and the association outside. The training of resistance workers was long and arduous; and he could not picture members of the council dropping by parachute into resistance areas armed with a modicum of the Independence Fund. The association should now coöperate with good grace. The strength of the latest vote against the service could best be used in the negotiations that lay ahead.

Dr. A. V. RUSSELL (South Staffs) complained of lack of leadership by the council; there had in fact been abdication of leadership. He denied that public opinion favoured the Minister. In the last three weeks many patients had said to him: "I never thought the medical profession would let us down."

Dr. J. A. PRIDHAM (council) could see no other way in the present situation than to support the council's recommendations. Once over the hurdle of compensation, the association would have a stronger position.

Dr. O. C. CARTER had opposed in the council the resolution which Dr. Dain had placed before the meeting; and he opposed it now. He saw the debate as the El Alamein of British medicine; and he could not believe that concessions could be won "when we're all in the bag." This was the last chance of fighting back.

Dr. JANET AITKEN (council) argued that the profession by its vote had made it impossible for opposition to be continued. Enough doctors had signified willingness to enter the service for it to be started, but not enough to make it efficient. Thus though the profession could not stop the service being initiated, it might prevent its being efficient; and this would be shameful. Any comprehensive service had dangers; and small issues would still have to be fought. The association would have more chance of winning these issues if administrators were convinced of the association's desire to make the service a success. The only way to achieve professional unity was to work towards an efficient service.

Dr. J. W. HOPE-SIMPSON (mid-Herts) called for postponement of the start of the service.

Dr. R. W. COCKSHUT (council) said that a considerable victory had been won. He did not understand a reference by Lord Horder to stragglers and deserters. Since when had it been wrong for a member of the council to give his honest opinion? Would it be right to pretend to want to go on fighting when the profession did not intend to fight? The only large outstanding issue was goodwill; to fight for this would mean throwing all the gains into the scale, and all might then be lost. Three years ago it was impossible to believe that so many gains would be won; and these represented a great achievement. The association had agreed to a 100% comprehensive service; and any fight must take place within that field. Fears had been expressed about future legislation; it was impossible by an Act in 1948 to guarantee freedom in 1950.

Prof. R. S. AITKEN (Aberdeen) reported that his division recognised that a fight was out of the question; any attempt at it would end in a sad result reminiscent of Don Quixote—a mixture of ridicule and pathos.

Dr. S. WAND (council) argued that the victory had been resounding; in fact some of the army had started to go home, as was shown by the dwindling rate of contributions to the Independence Fund, the plebiscite figures, and the fact that 4000 doctors had signed on. The tasks now should be to consolidate the gains and to remain unified.

Dr. S. F. L. DAHNE (Reading) believed that most of those who had voted in favour of the service had done so hating it; they had lost heart or had been misguided.

Dr. J. A. BROWN (council) asked those who sought continued resistance to say what the association was

to do. Should it hold another plebiscite? Should it advise doctors not to join when they had already joined? Was the association to go in at the heels of the profession? "I should hope not." Many were loyally withholding agreement to enter until the representatives' meeting was over; but whatever the result of it they would still enter the service. Did those who spoke for resistance want to put an end to the association as a negotiating body? The only substantial outstanding principle was that of goodwill; and that issue had been killed in the House of Commons debate on Feb. 9 when an Opposition spokesman said he considered that it had been decided in the committee stage.

Dr. G. CATHERINE EVANS (East Kent) spoke of doctors entering the service with "deep-seated frustrations and sickness of heart." Dr. A. C. E. BREACH (Bromley) found that the smell of appeasement which had been going through the country was concentrated in the meeting hall. Dr. DAIN replied that the association had won the greatest victory ever achieved against this or any other Government. By standing firm they could make certain that what had been promised would be fulfilled. He pointed out that insurance practitioners had already signed on as follows: England 4456 (28%) out of 16,958; Wales 337 (37%) out of 1003; and Scotland 1000 (36%) out of 2768.

The Kingston-on-Thames amendment was lost by a large majority.

Dr. DORIS ODLUM (Bournemouth) put an amendment that the profession should not be advised to coöperate in the new service until an amending Act had been passed and approved by a majority vote of the profession. Dr. DAIN retorted that the contents of the amending Act had been promised by the Government. It might have been possible to secure postponement if it had not been that the Health Service Act was linked with the National Insurance Act, which was also due to operate from July 5. The amendment was lost by a large majority.

The council's recommendation was approved by a very large majority.

Dr. G. H. SEDGWICK (Rotherham) won approval for a rider that the profession should accept service on the understanding that they might resign or take such other steps as were considered necessary if the amending Act and terms of service were not satisfactory to the representative body.

#### NO CENSURE

Dr. A. C. DE B. HELME (Guildford) put a motion of no confidence in the council. Dr. D. M. THOMSON (Dartford) recalled that at their previous meeting representatives had agreed to support the council in any action it took. Dr. DAIN pointed out that the council could be changed every year; nothing it had done justified the Guildford motion. This was heavily defeated.

#### RECOMMENDATIONS ADOPTED

Two further recommendations were put forward by Dr. Dain, on behalf of the council; the second was slightly modified by representatives, who adopted both. They were as follows:

That the representative body urges the profession to maintain its strength and unity in order to mould the service in accordance with the public interest and with enlightened professional opinion, and continuously to protect the profession's legitimate freedom and interests.

That the public be adequately informed that, for reasons outside the control of the profession, the inception of the new service cannot be followed for some time to come by all the improvements promised by the Government in the medical services of the country, because of the shortage of personnel, medical and nursing, and of the difficulty of providing the necessary premises and equipment, and although the medical profession will make every endeavour to work the scheme, it cannot hold itself responsible for the Government's promises.

## NATIONAL HEALTH SERVICE

### AMENDMENT AND MODIFICATION

AN account of recent discussions between the British Medical Association and the Ministry of Health is given in a letter sent last week by Sir William Douglas, secretary to the Ministry, to Dr. Charles Hill, secretary of the association. The discussions, Sir William says, will, no doubt, be continuing and finding new grounds to cover. Meanwhile he reviews the present position.

The main subject has been the content of the amending Bill which the Minister agreed to propose to Parliament. The Minister agrees that it should include:

(1) Whatever clarification of the position of partnerships may be found necessary in the light of the report of the legal committee which is now examining that question. (So far as is at all practicable, this clarification will be made to operate retrospectively to July 5.)

(2) Provision to make clear that a whole-time salaried general medical service cannot be introduced by regulations—i.e., would need a further Act of Parliament. (This would include provision precluding the imposition by regulation of any universal full-time consultant service.)

(3) Provision for executive councils to have the right to select their own chairmen, after the term of office of the present chairmen expires next March.

(4) Provision to enable the professional member of the tribunal to be one of a panel of available members and not a fixed individual—so that the member may in each case be suitable in experience and otherwise to the particular issue before the tribunal.

(5) Power to the executive councils, where the local practitioners agree, to cover the costs of the local medical committee (by the necessary deduction from the practitioners' remuneration).

**Basic Salary.**—The Minister has proposed a right to all doctors to opt for the £300 basic salary, with smaller capitation fee, if they so desire. He is impressed by the arguments put to him that an unrestricted option of this kind might often mean that one doctor could gain inequitably at the expense of another. He is prepared, therefore, to stipulate that the option should be only on the recommendation of the executive council (having ascertained the circumstances and consulted the local medical committee). But he would propose to give executive councils general guidance as to the principles on which they should allow or reject an option, and moreover to give the doctor whose option is rejected a right of appeal to the Minister.

**Midwifery.**—With, as he believes, the full concurrence of professional opinion, the Minister had provided for a system of creating local lists of doctors whose experience is regarded by a professional committee as justifying special recognition in midwifery. For all on this list who undertake the care of a maternity case he has already provided for a special fee of £7 7s. Anyone who satisfies the committee of his suitability can join that list and it entails no obligation to undertake any case unless the doctor wishes to do so. Thus a doctor, perhaps towards the end of his practice, who has all the suitable experience but who no longer wishes to undertake midwifery save for a few patients whom he may wish to oblige, could go on the list and yet only take those cases which he wanted to undertake. Others will go on, no doubt, with a view to regular and frequent midwifery work—and it will, no doubt, be these with whom the local midwifery authorities will wish to make arrangements to be "on call" to midwives under the Midwifery Acts.

All of this means that there will be some doctors whose names are not on the list just mentioned. As the proposals stand, these other doctors are not, of course, in any way debarred from midwifery. It is simply that they are not recognised for special payment for it under the scheme. It has been represented to the Minister that, as they cannot charge fees to their own public patients

within the scheme, they may be undertaking midwifery in some cases without either private fee or public remuneration for it. The charging of a private fee to a patient on a doctor's public list for anything within the field of general medical practice would, in the Minister's view, be repugnant to the whole new health scheme. However, on reflection, he feels that the main objective—of encouraging the development within general practice of groups of practitioners with rather more than normal aptitude for midwifery—could still be achieved if he introduced a public payment of £5 5s. for all doctors and £7 7s. for those on the special list.

**Freedom of Publication.**—Regional hospital boards and management committees have already been told by the Minister that no prior consent should be required to any publication, as part of the conditions of service of consultants. No express provision need be made for general practitioners, as under the general terms of service it would be impossible for anyone to require consent as there is no power to do so.

**Further Discussion.**—In conclusion Sir William Douglas says that these are all matters on which the Minister has already expressed his willingness to adjust details of the scheme to the profession's views. "He will welcome continued discussion, both before and after July 5, and it is inevitable that there will be found other matters on which adjustment is needed in a measure of this magnitude—indeed he will be himself finding points for amendment, no doubt, in other parts of the Act as its working reveals them. He would, however, point out that—as a matter of procedure—it will be necessary to limit as far as reasonably possible the amending Bill already promised, if it is to be passed quickly and so to relieve any anxieties of those in partnership. For further points, of his own and of others, there will be further opportunities. He hopes to have the profession's collaboration throughout these stages."

## GENERAL MEDICAL COUNCIL

SESSION MAY 25-27

The name of *James Samuel Ashe* was restored to the Medical Register.

### Penal Cases

*Brendan O'Carroll*, registered as of 50, Onslow Square, London, S.W.7, L.A.H. Dubl. (1937), had been sentenced to 7 days' imprisonment at Swansea on Oct. 22, 1947, for procuring drugs contrary to regulation 2 of the Dangerous Drugs Regulations, 1937.

Mr. S. Winterbotham, for the council, explained that Dr. O'Carroll took the drugs from the hospital dispensary for his own use; he was dismissed from his post at the hospital and entered an institution for treatment for drug addiction. In 1942 his name was erased from the Register at his own suggestion, following a sentence of 28 days' imprisonment for being in charge of a car when under the influence of a drug. After several applications his registration was restored in 1946.

The council now directed the registrar to erase his name again from the Register.

*William Hamilton*, registered as of 3, Smith Crescent, Kilwinning, Ayrshire, M.B. Glasg. (1939), had been summoned to appear before the council in June, 1947, after he had been fined £20 for not keeping a dangerous drugs register; he had also been charged with improperly supplying tincture of opium to a known addict. Dr. Hamilton did not attend and his case was twice postponed.

Mr. Winterbotham now produced a telegram saying that Dr. Hamilton refused to attend. Mr. Howard, representing Dr. Hamilton, said the doctor had explained in a letter that he gave the addict the opium because in his opinion it was necessary, the patient having attempted to commit suicide when deprived of the drug; that he prescribed the opium only for a given period and gradually reduced the dose; and that he treated the patient without opium both before

and after that period. Dr. Hamilton was unaware that he must keep a register; he did not supply the opium but issued prescriptions for it. He served in the R.A.M.C. from 1942 to 1944, when he was discharged with a pension and was admitted to a Dumfries institution for about a year. He next obtained a practice in Liverpool. His authority to prescribe dangerous drugs had not been withdrawn.

Inspector Grant, of the Ayrshire constabulary, told the council that Dr. Hamilton now had no real practice but issued prescriptions mostly in public houses which he frequented; he was looking ill but not too ill to travel.

The council directed the registrar to remove Dr. Hamilton's name from the Register.

#### COMPLAINT BY PATIENT'S HUSBAND

*Thomas Elliott*, registered as of 2, Westcroft Gardens, Morden, Surrey, M.B. Glasg. (1928), appeared to answer a charge, made by a Mr. Sydney York, of being so far under the influence of drink as to be incapable of carrying out his professional duties while in professional attendance on the complainant's wife on Feb. 17 and 19, 1948. Dr. Elliott was accompanied by Mr. Oswald Hempson, for the Medical Defence Union, and Mr. York by Mr. Brundrit.

Mrs. York said Dr. Elliott had been their family doctor since 1938, and until February of this year there was no complaint against him except that he was unreliable in coming when sent for. She started tonsillitis on Feb. 5 and developed a quinsy. Dr. Elliott saw her three or four times between Feb. 6 and 17. On Feb. 17 he arrived about 10 p.m., when Mrs. York's mother, Mrs. Bristow, was present but Mr. York was out. Mrs. York alleged that Dr. Elliott's voice was thick and indistinct; on taking a thermometer out of her mouth he dropped it in the bedclothes; he put a tablespoon into her mouth and let it drop into her throat; he averted his face to prevent her smelling his breath; and he gave her unwrapped tablets out of his pocket. "I thought he was drunk and was nervous of him, so I told my husband," she remarked. Dr. Elliott did not come next day, as he had promised, but he came four times on Feb. 19. He was normal at 9 a.m., and at 1 and 6 p.m., but at 10 p.m., while her husband was there, Dr. Elliott came into the bedroom, sidling round the door as if he needed support; he threw his case on the bed, and went unsteadily to pick up some penicillin tablets from the dressing-table. Mr. York thereupon called the doctor out of the room and sent him away. Dr. Turnbull, Dr. Elliott's partner, was sent for, and he lanced the quinsy.

Mr. York said when he opened the door to Dr. Elliott on Feb. 19 the doctor smelled heavily of alcohol and walked unsteadily; his speech was blurred.

Mr. Hempson: "Dr. Elliott drove his car to your house, left it some distance away, walked across a cycle-track and a path, climbed two flights of stairs, said 'Good evening' to you, and negotiated a not very wide passage without bumping into its walls."

Mr. Iles, who was delivering a document at Mr. York's door at the time of Dr. Elliott's visit on Feb. 19, recalled that Mr. York opened the door to him and asked him to wait outside. After a few minutes Dr. Elliott came out. Mr. Iles formed the impression that he was suffering from drink, because of his way of walking, his red face, his puffy eyes, and the fact that he took hold of the banisters as if he needed assistance to get down.—Mr. Hempson pointed out that Mr. Iles did not know the doctor, and did not know the usual colour of his face or his normal behaviour.

Mrs. Bristow maintained that Dr. Elliott smelled strongly of drink and did not seem to know what he was doing. She was afraid to accept his offer of a lift home in his car. He said he did not know the Morden roundabout, which was close to where he lives. Answering Mr. Hempson she agreed that Dr. Elliott was alert enough to note that Mrs. Bristow was about to leave; the Morden roundabout was about 2 miles from his house.

Mr. Ericson gave evidence that when Dr. Elliott called to see his children late at night on Feb. 19 he was perfectly sober. Asked by the legal assessor whether he knew the Morden roundabout, he replied "Which one?"

Dr. Elliott denied that he was drunk on either Feb. 17 or 19. He had taken some Empire wine before both the visits to Mrs. York. When Mr. Iles saw him on the doorstep he was not unsteady on his feet; he might have held on to the banisters—"That is what banisters are for." He suffers from chronic ethmoid sinusitis and that might have affected his voice.

He did not lance the quinsy because he had no chance of examining Mrs. York's throat on the evening of Feb. 19.

Mr. and Mrs. Crumley agreed that when Dr. Elliott called on them after his visit to the Yorks on Feb. 17 he did not smell of alcohol and was not under the influence of drink. Mrs. Elliott said her husband was habitually temperate, and when he returned home after finishing his visits on Feb. 19 he was sober.

After Mr. Hempson had denounced the flimsiness of the evidence against Dr. Elliott, the council found that the charges had not been proved.

#### CERTIFICATION OF PREGNANCY

*Cecil Thomas*, registered as of Maescywmmer, Hengoed, Glam, M.B. Wales (1940), had been reported to the council by the Recorder of Devizes, who alleged that Dr. Thomas had wrongly certified that a woman was pregnant, that the expected date of confinement was in 2 months' time, and that she was unfit to attend a court of justice.

Four charges were made: (1) that the certificate was given on Oct. 1, 1947; (2) that Dr. Thomas did not see or examine the woman between about Sept. 3, when he saw but did not examine her, and the date of giving the certificate; (3) that he did not make any, or any proper, professional inquiries before certifying; and (4) that the certificate was untrue, misleading, and improper within the meaning of paragraph 1 of the Warning Notice issued by the council.

Mr. Winterbotham explained that the woman and her husband were on bail to appear to answer a charge, and this certificate saved the woman from being tried with her husband. Later the Recorder of Devizes had the woman examined by two independent doctors, who agreed she was not pregnant.

Nurse Humphreys, county midwife, said she examined the woman in her home and though she had "all the symptoms of pregnancy" she came to the conclusion that she was not pregnant. The woman persisted that she was pregnant, and Nurse Humphreys told her to attend the antenatal clinic to obtain a doctor's diagnosis.

Mr. Winterbotham said that Dr. Garfield Evans, who examined her at the antenatal clinic, found that, though there was a history of amenorrhoea since March, there was no evidence of pregnancy. According to Dr. Thomas's written statement of March 21, 1948, the woman told him that she had consulted Dr. Phillips (Dr. Thomas's employer, who was much senior to him) and had been told that she was pregnant; the surgery was not suitable for vaginal examinations. Dr. Phillips stated in writing that he saw the woman for the first time early in September, 1947, when she wanted a certificate for extra rations for her pregnancy. Her appearance bore out her statement, and he was confident that she was pregnant. He did not give her a certificate, because he had run out of forms, but he told her to call back in a day or so when Dr. Thomas would give her a certificate.

Dr. Phillips gave evidence that Dr. Thomas had been his assistant for two years and had been entirely satisfactory. The police had asked him to perform a complete examination in view of the doubt raised by the Recorder. The woman gave a history of amenorrhoea since March, a watery discharge from enlarged breasts, an enlarged abdomen, swollen legs, and foetal movements. The abdomen looked like that of a five-month pregnancy. On further examination, however, there was no sign of pregnancy. His opinion was that the diagnosis was pseudocyesis and the woman fit to travel.

Mr. Hempson: If she had been pregnant, it would not have been wise for her to travel from Wales to Wiltshire.

Mr. Winterbotham: "Do you always give certificates for alleged pregnancy without examination?"

Dr. Phillips: "I don't examine them fully unless there are special reasons."

Mr. Hempson: "After the examination requested by the police did you tell her she was not pregnant?"

Dr. Phillips: "I did, and she said I didn't know what I was talking about."

Dr. Thomas said he joined Dr. Phillips in April, 1946. There were two surgeries, at which the doctors attended alternately. Certificate forms often ran out. The forms for pregnancy were the same as those for various diseases requiring special rations. On Oct. 1 the woman's husband applied for a certificate to say his wife could not travel to Wiltshire to give evidence in a case of buying stolen bicycles. He considered the woman was unfit for a long journey, standing up in court for a long time, and the emotional stress of appearing in court.

Mr. Hempson: If he had known the woman was on a charge, he would still have given the certificate.

The President: "How did you know on Oct. 1 she was still pregnant?"

Dr. Thomas: "I did not. I was relying on the truth from her husband."

The President: "She might have had a miscarriage."

Dr. Thomas: "Yes, and even then she would have been unfit to travel."

Mr. Hempson, addressing the council, asked with reference to Dr. Thomas's acceptance of his employer's diagnosis: "Can none of you accept the opinion of a consultant without confirming it yourself? This was a young doctor relying on his older and more experienced employer. The woman throughout was consistent in her belief that she was pregnant. Have you got to think all the time of pseudocyesis and make lots of resented vaginal examinations? It is impracticable in ordinary practice."

The council found the first and second charges proved to their satisfaction but that Dr. Thomas was not guilty of infamous conduct in a professional respect.

#### JUDGMENT POSTPONED

*James Kirkness*, registered as of 5, Warrender Park Crescent, Edinburgh, 9, L.R.C.P.E. (1925), was charged with having been convicted in Edinburgh on Dec. 15, 1947, of breach of the peace and assault and fined £5.

Mr. Winterbotham said that Dr. Kirkness and another man went to the Edinburgh City Hospital and entered the kitchen and the nurses' dining-hall, where Dr. Kirkness struck a nurse with a glove. A nurse telephoned the hall-porter about them. The hall-porter telephoned the police and got out the hospital ambulance and looked for Dr. Kirkness in the grounds. They found him in a motor-car and blocked his exit with the ambulance.

The charge was proved and judgment postponed for twelve months.

*James Scott*, registered as of 68-69, Guilford Street, London, W.C.1, M.B. N.U.I. (1926), was charged with having been convicted on April 14, 1937, of being in charge of a motor vehicle on a road while under the influence of drink; on Sept. 20, 1940, of neglecting without reasonable cause to proceed to sea in a ship in which he was lawfully engaged to serve; on March 4, 1947, of being found drunk; and on Oct. 16, 1947, of being under the influence of drink while in charge of a motor-car.

The charge was proved and judgment postponed for a year.

*Trevor Owen Williams*, registered as of 24, Dudlow Lane, Liverpool, 18, M.B. Lpool (1913), was charged with having been convicted on Nov. 28 and Dec. 5, 1947, and March 6, 1948, of having been found drunk.

The charge was proved and judgment postponed for a year.

*Basil Elliott*, registered as of 106, St. Georges Terrace, Newcastle-on-Tyne, 2, L.M.S.S.A. (1928), was charged with having been convicted on July 13, 1936, of driving a motor-car recklessly and colliding with and damaging a pedal bicycle; of driving a motor-car recklessly and colliding with a motor-car whereby both vehicles were damaged and a man was injured; and of driving or attempting to drive a motor-car while under the influence of drink; on June 5, 1945, of being drunk in charge of a bicycle; and on Jan. 27, 1948, of driving a motor-car while under the influence of drink.

The charge was proved and judgment postponed for a year.

*John Matthew Campbell*, registered as of Dromore, Omagh, co. Tyrone, M.B. N.U.I. (1942), was charged with having been convicted on Aug. 10, 1945, of driving a motor-car while under the influence of drink or drugs, and on Jan. 9, 1947, of being in charge of a motor-car while under the influence of drink.

The charge was proved and judgment postponed for a year.

*Malcolm Andrew Graham-Yooll*, O.B.E., registered as of Elm Tree House, Pembroke, M.B. Edin. (1923), was charged with having been convicted on May 5, 1943, of not keeping a register as required by the Dangerous Drugs Regulations, 1937, and on Aug. 11, 1947, of six further similar offences.

The charge was proved and judgment postponed for two years, interim testimonials being required at the end of a year.

#### CASES ADJOURNED FROM PREVIOUS SESSIONS

*William Belton*, registered as of 39, Blakehall Road, London, E.11, M.B. N.U.I. (1921), appeared for judgment postponed from June, 1947. The council did not erase his name.

*James Alphonsus Heerey*, registered as of Virginia, co. Cavan, M.B. N.U.I. (1941), had gone to Australia. The council did not erase his name.

*Raymond Criswick Evans*, registered as of 113, Sackville Road, Hove, M.R.C.S. (1932), attended to hear judgment postponed from November, 1947. The council did not erase his name.

#### THE HARROGATE HEALTH CONGRESS

THE 54th congress held by the Royal Sanitary Institute since its foundation a year after the great Public Health Act of 1875 was opened by Lord Inman at Harrogate on May 24. The 2400 delegates, representing over a thousand different bodies, including 39 foreign governments, heard him describe the conditions at Charing Cross Hospital 100 years ago—patients admitted only on one day a week, often to beds just vacated by fever patients; bed-linen not changed until worn out; nursing by untrained "watchers" paid 5s. a week, living out. His graphic description gave point to the full week of papers by engineers and architects, veterinary surgeons and sanitary inspectors, health visitors, medical officers of health, epidemiologists, nutritionists, town and country planners, and others who, under the banner of the institute which has existed "to draw together men of like mind," have assisted in bringing about the improved hygiene of today.

Perhaps the most encouraging feature of the week was the evidence of a new spirit in public health, largely arising from the reshuffle of administrative responsibilities produced by the Act of 1946. This can be simply stated as the spirit of team-work under the medical officer of health, which was the theme of Dr. Frederick Hall's presidential address to the conference of M.O.H.'s, its objective being a community in which hospitals are no longer needed. Prof. G. S. Wilson, as president of the preventive medicine section, expressed his faith in the future of the preventive weapons of epidemiology. and Dr. W. H. Bradley emphasised the need to employ the statistician to the fullest advantage; it is to be hoped that before long every health authority will have added this important member to its team. In the maternal and child health section, which was under the presidency of Dr. May Baird (Mrs. Dugald Baird), who is chairman of a public-health committee and of a regional hospital board, Dr. W. S. Walton, G.M., of Newcastle-on-Tyne, and Dr. Catherine Morris Jones, of Gloucestershire, showed the way to further progress under section 22 of the National Health Service Act and circular 118, which explains it. The need is for the midwife, the general practitioner, and the obstetrical specialist to work with the M.O.H. in making maternity a normal physiological process. Throughout the congress the importance of bringing the specialist into the planning of health was often stressed; in all branches of medicine and surgery the specialist should play his part in prevention as well as in cure and his ultimate object should coincide with that of the M.O.H.—to make hospitals redundant.

The health visitors' section, under the presidency of Prof. A. Topping, was of particular interest in view of the expanding scope of the health visitor in the field of social medicine, where she must now become a true partner of the general practitioner and of the hospital. The importance of direct communication between almoners and health visitors was urged by Miss Steel, secretary of the Institute of Almoners, and the discussion brought out the need for further consideration of the training of both almoners and health visitors: is the time now ripe for an amalgamation of these two trainings?

Much of the value of a congress like this lies in the broadening influences which a series of joint meetings can exert on laymen and technical experts alike. This conception of joint meetings with laymen is one which the doctor should cultivate; as was often remarked at the congress, the clerks and treasurers of local authorities should have been present at most of the meetings.

## LABELLING OF AMPOULES OF ANÆSTHETIC DRUGS

THE following recommendations are the result of discussions between the Association of Anaesthetists, the Association of British Chemical Manufacturers, and the Wholesale Drug Trade Association, under the aegis of the Ministry of Health.

*Scope.*—The recommendations for indelible marking rather than paper labels shall apply to all ampoules containing (1) solids, (2) solutions; and (3) solvents which are normally used for the production of (a) muscular relaxation, (b) spinal, regional, or local analgesia, and (c) general anaesthesia by (i) intrathecal injection, (ii) epidural injection, (iii) intravenous injection, (iv) intramuscular injection, and (v) tissue infiltration.

*Text of Label.*—In the case of a B.P. product, the B.P. name or its official abbreviation should appear on the ampoule. The B.P. name or abbreviation should, by size of type or layout, be as conspicuous as any proprietary name on the label. Where there is only a B.P. monograph for the active ingredient/s, and it is desired to put a proprietary name on the ampoule, such descriptions as "ABC brand injection of X B.P." will be regarded as unexceptionable.

The quantity of preparation in the ampoule should wherever possible be specified—in the case of a liquid as the volume of the liquid extractable by syringe, and in the case of a solid as the total weight of the contents of the ampoule. It should be noted, however, that legislation such as the Dangerous Drugs Acts and the Poisons Rules require the absolute contents to be stated.

While the method of expressing the strength of preparation is left to the manufacturer's discretion, the manufacturer should try to adopt the style (whether on a percentage basis or in the form of "1 in . . .") which is best calculated to assist the anaesthetist.

*Durability of Labelling.*—Marking on ampoules should be such as will remain legible throughout sterilisation of the outside surface of the ampoule and during storage of the ampoule in disinfectant solutions. Labelling which remains legible after the following treatment can be regarded as satisfactory: (1) autoclaving at 115°C for 30 minutes, followed by (2) immersion in undiluted lysol at 85°C for 24 hours.

## Medicine and the Law

### Non-consummation of Marriage

It is proving a slow business to ascertain the meaning of "wilful refusal to consummate the marriage," one of the grounds for a decree of nullity under the Herbert Act of 1937. English judges dislike making any decision which goes a hair's breadth beyond the facts of a particular case. Thus when the Lord Chancellor delivered the opinions of the House of Lords in *Baxter v. Baxter* on the question whether insistence upon the use of contraceptives amounted to wilful refusal of consummation, their lordships expressly disclaimed any intention to decide the effect of practising coitus interruptus. This leaves some married pair the privilege of giving their name to a leading case in the textbooks on divorce law. Owing to a curious and regrettable difference of judicial opinion, some married pair will have the further privilege of paying for litigation up to perhaps the highest appellate tribunal. On May 10 Mr. Justice Finmore held, in *Grimes (otherwise Edwards) v. Grimes*, that the husband's insistence upon the practice of coitus interruptus against the wishes of the wife amounted in law to wilful refusal of consummation; it was not natural or complete intercourse; it could be distinguished from the practice of using contraceptives. Next day Mr. Justice Willmer held the exact opposite in *White (otherwise Berry) v. White*; coitus interruptus was not wilful refusal to consummate, though perhaps, if it caused injury to the wife's health, it might amount to legal cruelty. He therefore refused to award the decree of nullity which his brother judge had awarded in like case, but he did find himself able to grant a decree nisi of divorce on the ground of cruelty.

It seems a pity that there is no clearing-house of legal ideas at the Royal Courts of Justice. Within those walls much is heard when doctors differ. For the litigant the lack of judicial unanimity is just as bad.

## In England Now

### A Running Commentary by Peripatetic Correspondents

My first intimation of the visit to our hospital of the G.N.C. inspector was a remark by the residents' maid: "Well, there *must* be something on. New coverlets 'anded out for the doctors' beds today!"

There was indeed "something on." The tension mounted steadily for about a week, and we doctors observed the activities with interest mingled with disgust and occasionally frank anger—for instance, when one ward sister was too busy washing the walls to go round with the registrar. That particular ward received two dozen new masks to be worn when doing dressings—an unheard-of precaution in normal times; one feared that the nurses would not know how to put them on.

All the children were decked out in new clothes, of course. It's amazing what a metamorphosis comes over a ward when the children look neat instead of being dressed in unsuitable shrunken woolies kindly but impractically knitted by "circles" all over the place. Flowers abounded in every ward, new crockery appeared round every corner, and the nicest looking tables were strategically placed in the nurses' dining-room. An impressive array of books on the secretary's window-sill (clearly visible from the road) stimulated keen discussion on their content; *Hospital Catering* and *The Welfare of Residents and Nurses* were chosen as two appropriate if improbable titles.

At the P.T.S., the room in which the pro's both ate and studied, more or less simultaneously, was suddenly turned into a "quiet room." This involved putting the dining-table into the front hall, and the draught from the six doors leading off this new "dining-room" was chilling to both body and soul. Proof of the ample accommodation for nurses was provided by a simple ruse: two of the occupants of a room containing five closely packed beds happened to be on holiday, so their beds were dismantled and stored out of sight.

This exhibition of awareness of grave faults in the provision of elementary amenities for patients and staff makes it hard for the authorities to justify the usual absence of effort to remedy the deficiencies. Camouflage when necessary but never an attempt at cure is apparently their motto. This, I gather, is not an annual visit; if it was, the frantic improvements might have more chance of surviving. True, it is pleasing to see the nurses in spotless aprons even this once; but do such tactics inspire the nurses with respect for those in charge of their welfare and education? The only "justification" I have so far heard came from one of the sisters: "Well, the same thing goes on in all hospitals these days."

\* \* \*

It's always interesting, and sometimes amusing, to take one's own medicine. I shall never forget the agonised howl of the student who chewed a mouthful of quassia chips. I wonder if he has ever since then brought himself to prescribe it. Our hospital made a brave effort to interest us in practical pharmacy, but unfortunately it was always on a Saturday morning when many of us had more than half our minds on the afternoon's rugby or hockey, even if we weren't absent at an away match. It is fortunate that my present income does not depend on my knowledge of the pharmacopoeial flavourings.

I've always been a little chary of trying the habit-forming drugs, but I certainly enjoyed my morphine when I had my appendix out—though it didn't altogether relieve my apprehension when I found that I was too dopey to "prep" myself and had to surrender to a fellow student. Thiopentone, however, soon brought a more complete and blessed relief. With other barbiturates I have been more familiar, for I am one of that wicked band—dare I confess?—who prescribed phenobarbitone for my epileptic outpatients in monthly supplies, and was even tempted to follow my predecessor and give a three months' supply to the wretched young dement who couldn't resist kicking me whenever she attended. We were more careful over the patients with anxiety states and other neuroses, who were never given more than a week's supply of phenobarbitone

at gr. 1½ per night; but I am wondering now if we weren't too careful, for I have found that my optimum dose is undoubtedly gr. 3.

I first took this at 11.40 one night as I stepped into the 11.50 from Paddington, being careful to choose a coach which came off at Plymouth—the trains back from Penzance are so slow. I had no difficulty in keeping the compartment to myself, for having had to ask a porter to unlock the door to let me in, I had seen it locked again behind me. As I had had a few pints of beer, I was a little apprehensive when I found that the corridor door was also locked, but, hoping for the best, I settled down with a dressing-gown for a pillow and a raincoat for sheets and blankets, and remained conscious only just long enough to notice the initial jerk as we pulled out of the station. "Come along now, all change 'ere." The wrong train? Surely not. A nightmare? Maybe; but no, we were at Plymouth after 7½ hours' unbroken sleep. I was still a little sleepy in the bus, but fully alive again after a shave and breakfast.

On another occasion, though, on a longer journey, I overstepped the mark. My first dose of gr. 1½ proving insufficient, I took a further gr. 3. I managed the bus from the station but succumbed to my bunk on arrival. Awaking at lunch-time I was "absent over leave for 4 hours." The above was my "reasons in writing," but the P.M.O. was not amused.

\* \* \*

Age cannot wither nor custom stale the infinite variety of uses for P.D.T. From my predecessor I took over, among other things, a wireless set. He warned me that it made noises even when switched off. I looked at him with a wild surmise; did he need his leave even more than he thought? But he demonstrated. He disconnected everything, even the aerial, and bade me listen. I heard it; it sounded like a patient with ichthyosis grinding his teeth and having a good scratch at the same time. "Polarisation, I think," said my predecessor. But on comparing notes we found that the passing of the years since our school days had left us both vague about what polarisation really is.

He left, but the malady lingered on. It even reached out its fingers into my nightly sleep in the next room. Desperate, I removed the back of the set and looked in. Polarisation! Everything was covered with fine sawdust, and I called my faithful Ah Suang, who with a screw-driver and other weapons opened up several rotting tunnels in the woodwork and extracted two fat pale larvæ of the boring beetle, each about the size of the end of the little finger and armed with a business-like ring of teeth. Sentence was duly carried out; but that night the noise started again. A friend then took the set away, found two more larvæ, filled all the tunnels with P.D.T. and wax, and brought it back. A few days later, faint but pursuing, bloody but unbowed, it started again. I gave it up; but in another two days it stopped. The sole survivor had probably bored its way into a lethal P.D.T.'d tunnel. The rest is silence, and the silence is indeed a rest.

\* \* \*

I don't know if I was quite wide awake when I turned on the eight o'clock news (I learned bad sleeping habits when I was a junior resident and got up at 11 A.M.). What the loud-speaker said was this: "It concerns some dangerous drugs lost at Chipping Sodbury: between 11 and 12 P.M. yesterday, a green pillbox containing five tablets of one-methyl-4-betadiethylaminoethyl-aminothioxanthone and lots and lots of tablets of *dl*-2-dimethylamino-4:4-diphenylheptane-5-one . . . telephone number WHI 1212. . ."

Isn't science marvellous, Daddy? Eat your bun, my boy.

\* \* \*

" . . . In one case a swinging temperature chart proved very confusing. . . ." Some overcome this difficulty by nailing the chart to the wall, or by affixing weights along its bottom edge; the confusing effect can, however, be minimised by wagging the head from side to side in time with the swinging; a stiff whisky will also help.

## Letters to the Editor

### SERVICE UNDER THE ACT

SIR,—Now that the medical profession is committed to service under the National Health Act it is salutary to reflect upon the responsibilities with which we are faced. Many who, like myself, acting in good faith and in all sincerity, were conscientiously opposed to accepting service, may have a lingering sense of championing a lost cause and may consequently suffer from indifference and frustration. I maintain that such sentiments are illogical and dangerous. It may be that indifference to future developments is born of an admission of personal vacillation, and we may be diffident about espousing a cause which previously we rejected. Fundamentally, however, the position is unchanged because there is ever open to us the opportunity to strive for the promotion of medical practice in the highest tradition. No regulations can ever vitiate such effort; the conditions for which we so far have unsuccessfully striven may have meant the reader promotion of such effort, and though we may have lost the fight to secure these conditions we still have the goal ahead.

The road along which we have to travel in the coming months and years will be an arduous one, but I feel certain that the profession can conserve its integrity and the respect in which it is held by the community by assiduous and jealous guardianship of its rights and privileges. There will be additional demands made on us which will require probity, singleness of purpose, unassailable honesty, and personal sacrifice—and there are men in the ranks of our profession today admirably endowed with these qualities—in order to conserve the shreds of professional independence which remain to us. These must be maintained at all costs, for it is by independence of judgment and the exercise of initiative and facilities unhampered by cant and humbug that sound medical practice flourishes.

I firmly believe, despite the new order of things to come, and perhaps as a result of it, that we will be stimulated to preserve our rights and privileges as never before, and to be more sensible of our duties to the patient and the community as a whole. Perhaps there could be no more apt exhortation than that given by Osler in his well-known address *Æquanimitas*:

"Cultivate, then, gentlemen, such a judicious measure of obtuseness as will enable you to meet the exigencies of practice with firmness and courage, without, at the same time, hardening 'the human heart by which we live.'"

Bristol.

W. R. BLACK.

### IDIOSYNCRASY TO THIOPIENTONE

SIR,—I would like to report the following case of idiosyncrasy to intravenous soluble thiopentone.

A woman of 54 years had had no previous experience of thiopentone, but had had three inhalation anaesthetics without incident. She was given 7 ml. of 5% soluble thiopentone for a paracentesis of the left tympanic membrane. There was no extravasation of solution outside the vein. Shortly after recovery from anaesthesia the patient noticed pruritus of the forearms, and within the next hour or two this became more intense and spread over the whole body. An hour or so later an urticarial rash was discernible over the forearms and trunk, and within a short time this became universal and there was commencing oedema of the face and eyelids. A capsule of 'Benadryl' was given, and within a short time the pruritus eased and the patient slept. The rash began to subside and by next morning it had completely disappeared.

A history of serum sensitivity was later elicited. An intradermal sensitivity test was performed with 5% thiopentone solution, using distilled water as a control; the result was negative.

I am indebted to Mr. M. J. Maxwell for permission to publish this case, and to Dr. A. R. Hunter for his helpful advice.

In 1943, Hunter<sup>1</sup> reported two cases of idiosyncrasy to thiopentone, one of which progressed to vesication and pustule formation. In both, the rash began about

1. Hunter, A. R. *Lancet*, 1943, i, 46.



24 hours after anaesthesia. In the same year Davison<sup>2</sup> reported two cases with scarlatiniform rash and pyrexia. In 1946 Grant Peterkin<sup>3</sup> described a case of purpuric rash after thiopentone which began 2 days after anaesthesia and lasted a week. In the correspondence<sup>4</sup> which followed, four different writers gave details of five cases, including one where treatment with small subcutaneous doses of adrenaline was successful.

In the ten cases thus reviewed the rash varied considerably both in type and distribution, and with the exception of one case (described above), all subsided spontaneously within 2-7 days after operation. In four of the reported cases (including the present one) a skin-sensitivity test was performed, with only one positive reaction.

It seems reasonable to suggest that benadryl or one of the other anti-histamine drugs should be tried in these cases.

Manchester.

MARK SWERDLOW.

**SENSITISATION OF PENICILLIN-RESISTANT BACTERIA**

SIR.—The work of Voureka (*Lancet*, Jan. 10, p. 62) must have stimulated investigation into the sensitivity of staphylococci in many laboratories. The following is an account of failure to repeat her results.

Early in the year six strains of penicillin-resistant *Staph. pyogenes* and one micrococcus (284) were collected from routine cultures in this laboratory. The sensitivity to penicillin and the production of penicillinase, hyaluronidase, and  $\alpha$  toxin were tested.

Two of Voureka's techniques were repeated. In one technique the sensitive strain (*Strep. Heatley*) and the resistant organisms were grown separately in broth. Equal volumes of resistant and sensitive cultures were fused and left in the ice chest. Subcultures from the mixture were made at varying times—from 4 hours to 70 days. Staphylococcal colonies were picked off and tested for change of penicillin-sensitivity and penicillinase-production. In the other technique, *Strep. Heatley* and the resistant staphylococci were inoculated into one tube of nutrient broth, or *Staph. Mayo* and the resistant organism were inoculated together. These cultures were incubated at 37°C. The *Staph. Mayo* did not produce  $\alpha$  toxin, while the *Staph. pyogenes* chosen for testing did. Blood-agar plates incorporating a strip of filter-paper soaked in  $\alpha$  antitoxin enabled the test *Staph. pyogenes* to be isolated.

To test the penicillin-sensitivity, dilutions of penicillin were inoculated with one drop of a 1 in 100 dilution of an overnight growth of the test culture. For quantitative penicillinase estimation a plate was poured with assay agar containing

- 2. Davison, T. C. *Anesth. & Analges.* 1943, 22, 52.
- 3. Peterkin, G. A. G. *Brit. med. J.* 1946, ii, 52.
- 4. *Ibid.*, pp. 138, 172, 209, 340.

TABLE I—CHARACTERISTICS OF STRAINS BEFORE AND AFTER TREATMENT

Organism	Production of $\alpha$ toxin	Hyaluronidase (M.C.P. units)	Min. bactericidal concn. of penicillin		Units of penicillinase before and after treatment
			Before treatment	After treatment*	
1	+	5	> 1000	> 1000	50
2	+	5	> 1000	> 1000	100
3	-	0	16	> 50	10
4	-	2	> 1000	> 1000	25
5	+	5	500	> 500	25
6	+	5	> 1000	> 1000	50
Micrococcus (284)	-	0	6	4	0
<i>Staph. Mayo</i> and <i>Strep. Heatley</i>	-	0	0.02	0.02	0

M.C.P. units = Mucin clot prevention units.

\* Technique 1 at 4 hours and 30, 40, 50, 60, 70 days; technique 2 at 1 day and 30 days.

*Staph. Mayo*. Equal volumes of varying dilutions of penicillin and constant dilution of supernatant fluid from the broth culture were placed together in cups of an assay plate.

From table I it will be noted that micrococcus 284 is the only strain whose resistance lessened with treatment

TABLE II—CHANGING MINIMAL BACTERICIDAL CONCENTRATION OF PENICILLIN TO MICROCOCCUS 284 HELD AT ROOM TEMPERATURE FOR 80 DAYS

Day of test	1	3	10	15	26	80
Min. bact. concn. (units penicillin per ml.)	6	6	2	0.01	0.015	0.015

From Barber's observations (*Lancet*, May 8, p. 730) it has been established that in working with single colonies there is the chance of picking a more sensitive variant. However, this strain was further investigated. The nutrient broth culture 284 was left on the bench for 80 days. During this time its sensitivity was repeatedly tested. The result, depicted in table II, shows that a strain kept at room temperature in nutrient broth may become more sensitive to penicillin without any treatment whatsoever. The reverse process of raising the resistance of this strain was obtained by subculturing, from a growth in a tube containing a minimal penicillin dilution to the next tube with a higher concentration of penicillin. After 5 weeks, during which time the inoculations had been transferred twice weekly, the resistance was raised from 0.015 unit of penicillin per ml. to 3.0 units per ml.

We foresaw the possibility that the metabolites of strains sensitive to penicillin might be used therapeutically, incorporated in a cream, for nasal or skin carriers of resistant strains. For this reason the toxin and hyaluronidase production of sensitising and resistant strains was originally tested. It is obvious from our findings that at present there is not sufficient evidence that the sensitive variants may enable resistant strains to become penicillin-sensitive.

W. H. BENNISON  
HERTA SCHWABACHER.

Ministry of Health Laboratory, Sector IV,  
Peace Memorial Hospital, Watford.

**INFECTIONS OF THE HAND**

SIR.—Some months ago I was depressed by reading articles which advocated the archaic practice of early incision in the treatment of septic infections of the hand. Lack of adequate case records deterred me from written comment, and I waited in vain for any opposing view. THE LANCET for May 22 contains the answer.

I should like to congratulate the authors on an excellent piece of work, which should be brought to the notice of every hospital resident. The principles laid down by the writers are those which I have preached to my house-surgeons for many years. I was driven to adopt them by observing the results of orthodox treatment. It has given me great pleasure to note the results obtained in pulp infections. In the 1907 edition of Keen's *Surgery* one reads, under whitlow: "early incision is strongly indicated" to prevent bone necrosis. Who originated the doctrine I know not, but it makes scant allowance for the vis medicatrix nature.

I have reached a stage in my surgical career when I see few infected fingers other than those bad enough to require admission to hospital. In nearly every case the patient has been the victim of well-meant but ill-timed operation.

A few years ago I read a summary of some experimental work which demonstrated the dire effect on the defence mechanism of early incision of inflamed tissues. Perhaps some reader can supply the reference.

Northampton. C. C. HOLMAN.

SIR.—The conservative treatment of the infected hand as set out by Professor Pilcher and his colleagues is a most interesting departure from conventional treatment, which hitherto has seemed to be increasingly surgical. A similar change took place in the therapy of carbuncle, which was treated by cruciate incisions until the second decade of this century when Morison, a surgeon, introduced his hygroscopic paste and with it a new era of

conservative treatment, for which patients with carbuncles should be duly grateful.

So diverse and even opposing are present methods of treating septic hands that one is forced to the conclusion that human tissues usually react successfully to these predominantly staphylococcal lesions under the most varied of therapeutic environments. Some incise early; others late. Some advocate hygroscopic paste; others loathe it. Some praise wet heat; others shun it, while not a few avoid heat of all kinds.

The literature on the infected hand still treats these important lesions as if they were isolated surgical events. The implications of much bacteriological work on staphylococcal skin carriage is ignored. Sutherland and I,<sup>1</sup> in a recent study of 111 septic hands, found that 17 of the patients had a boil and 12 another septic hand during the course of 9 months, suggesting that the persistent carrier state should not be overlooked in the study of these cases. Again, staphylococcal lesions are contagious. Wright, working on nurses in the Emergency Medical Service, and Branson, on nurses at St. Bartholomew's Hospital, both found that the chief cause of sick absence was staphylococcal skin lesions and infected hands. This contrasts with industrial sick absence for which the main single cause is respiratory illness.

Sutherland and I showed that in an industrial community boils and infected hands varied from time to time not only in frequency but probably also in severity, and that both diseases had a parallel course and a seasonal peak in the autumn. These fluctuations, if confirmed, might show it to be fallacious for one surgeon to compare his results with another's. We also found that these staphylococcal lesions have greatly increased over the last few years. As these lesions and the associated carrier state are the chief reservoir from which many surgical tragedies, such as osteomyelitis, are derived, the significance is obvious.

It is curious that we do not see the things which are always before us. We notice with alarm some hundreds of cases of poliomyelitis or 3 cases of smallpox, but the great staphylococcal pandemic with its many ramifications in every branch of medicine and surgery catches us on the blind spot. We only recognise the individual lesions it produces.

Oxford.

G. P. B. WHITWELL.

#### MEDICAL PRACTICE IN SOUTH AFRICA

SIR,—At the meeting of the federal council of the Medical Association of South Africa held in Johannesburg at the end of February, 1948, grave misgivings were expressed regarding the prospects of the many doctor settlers who are continuing to enter the Union from overseas.

It is recognised that many who have already arrived have settled down and are building up practices; but it would seem that the number of medical men entering the country is out of proportion to the number of other settlers. Most of them are naturally unilingual, and, until they are able to become conversationally bilingual at least, the country districts present difficulties. The coastal areas and the larger cities are thus in danger of becoming overcrowded and the newcomer is having a more difficult time in establishing himself.

In addition the three medical schools of the Union are estimated as producing between 250 and 300 new graduates each year and this number annually will be seeking practices and appointments. Inevitably the majority of these younger men enter general practice and the number of appointments available to them is limited. Even the extension of the health-centre system will not make a great deal of difference, as the gradual development of these centres—reaching a maximum of, say, 400 in the course of time—will only absorb a certain number of the annual output of local graduates.

It is a matter of time before the new medical school for non-Europeans at Durban will be sending its graduates out into the world, and although there is vast scope amongst the native population for medical practice it is not of the kind that will produce a reasonably lucrative

practice. Probably a number of the non-European graduates will have to be employed in the Government's health centres as medical officers, with a probable diminution in the number of posts available to European practitioners.

It would be as well to consider the fact that South Africa has a population of roughly 2½ million Europeans, 1 million Coloured and Asiatic persons, and 8½ million natives. Of these the natives pay taxes which, together with considerable sums from general revenue, are devoted to native administration and welfare. The Coloured and Asiatic persons are also to some extent a charge on the State so far as taxation is concerned, and at the most about 1½ to 2 million Europeans are affected by direct taxation and in a position to pay their own doctors. Of these the majority is found in the urban areas.

As there were 5013 medical practitioners registered as at Dec. 31, 1947, it would seem that the ratio is reasonably satisfactory from the economic point of view at present. During 1947 443 medical practitioners were registered or re-registered, and of these 282 had received their qualifying degrees in South Africa. If the normal increase in the number of medical practitioners is to remain in the neighbourhood of 400 per annum it would appear that it will not be long before doctors in South Africa will be forced to emigrate if they are to continue the practice of medicine.

There is a tendency at present towards some form of national health service, although progress is slow. In any case the number of underprivileged persons requiring help makes such a service imperative sooner or later.

Medical practice is divided generally into the two classes—general practitioners and specialists—the latter being about one-eighth of the total number of practitioners on the medical register. The specialists' register was instituted about ten years ago at the request of the Medical Association of South Africa; but with the rapid strides recently made in the theory and practice of medicine it has been found necessary to tighten up the rules for the registration of specialists to such an extent that it is now very much more difficult to acquire legal recognition as a specialist. (Inquiries regarding ordinary medical registration, and registration as a specialist in particular, should be addressed to the registrar, S.A. Medical and Dental Council, P.O. Box 205, Pretoria.)

Normally an overseas medical man wishing to settle in the Union is welcomed (and he still is), but it is felt to be right and proper to issue a note of warning to men who may be considering leaving an assured income and living in the country of their origin for the chance of establishing themselves in the Union, where the possibilities of reasonable private practice are diminishing. No man would be wise who would give up what he has to settle here, until at least he had visited the Union—on holiday perhaps—to see things for himself and to make up his mind as to his chances.

A. H. TONKIN

Secretary, Medical Association of South Africa.  
35, Wale Street, Cape Town.

#### LEUKÆMIA AND WAR SERVICE

SIR,—On reading your article (May 22), on Kinkaid v. Minister of Pensions, I cannot help feeling that you have misinterpreted some of the learned judge's remarks.

In these pension cases there can never be any question of "finally establishing" that a certain type of disease is never to be accepted as attributable to, or aggravated by, war service. In a recent batch of cases, Docherty & others. v. Minister of Pensions, heard in the Court of Session, the question of putting diseases into classes which could or could not be attributable to war service was fully dealt with. The following quotation<sup>1</sup> from the opinion of the Lord Justice Clerk, Lord Thompson, given in these cases, shows that the Scottish Bench does not support the argument that it is possible to schedule various diseases for pension purposes:

"In our view there is no overhead method of solving the possible problems that may arise. The use of formulas and categories may cause injustice. The task of the Tribunal is to decide each case on the material before it."

1. Whitwell, G. P. B., Sutherland, I. *Brit. J. Indust. Med.* 1948, 5, 88.

1. Chapman's Reports, vol. 2, p. 657.

In view of the above, I venture to suggest that although Kinkaïd v. Minister of Pensions will no doubt guide us in all future leukaemia appeals, it will not, as you say, "dominate" the cases.

J. H. WOOD

23, Drumsheugh Gardens, Edinburgh, 3. Pensions Officer, British Legion, Scotland.

### SYNTHESIS OF KHELLIN

SIR,—Khellin, an active principle of *Ammi visnaga*, has recently been reported as showing promise as an antispasmodic and as a coronary vasodilator in the treatment of angina and bronchial asthma.<sup>1</sup> I wish now to report that a total synthesis of khellin has been accomplished by my colleagues, Dr. R. A. Baxter, Dr. G. R. Ramage, and Mr. J. A. Timson; patents are pending. Pharmacological tests by Miss Audrey Hudson, on the lines developed by Samaan,<sup>2</sup> who first subjected khellin to systematic investigation, have shown that synthetic analogues of khellin also possess similar properties, some in an enhanced degree. A detailed account of both the chemical and pharmacological investigations will be given later.

British Schering Research Institute,  
Alderley Edge, Cheshire.

J. S. H. DAVIES  
Director of Research.

## Parliament

### FROM THE PRESS GALLERY

#### Psychological Tests for the Civil Service

In a debate in the House of Lords on May 26 on the Civil Service Selection Board Viscount MERSEY drew attention to recent remarks by Sir Percival Waterfield, the first Civil Service commissioner, on the low standard in personality and intelligence shown by applicants. Did the Government, Lord MERSEY asked, endorse these remarks, and did they suggest any alterations in the present system?

LORD SIMON of WYTHENSHAW said that there seemed to be some prejudice against having a professional psychologist as one of the three C.S.S.B. interviewers. It seemed to be suggested that psychologists were a rather undesirable set of people. Admittedly psychology was perhaps the most difficult of the sciences; it was certainly in its infancy. But a psychologist had studied his subject seriously before being appointed to a job of this sort. The whole practice of the C.S.S.B. was to try to judge the mental characteristics of individuals and to estimate how they were likely to develop. Surely, said Lord Simon, that was a job which ought not to be left to amateurs. Lord LINDSAY of BIRKER admitted that he was not frightfully excited about psychology. He tended to share the view of the freshman who said: "Here philosophy ends and error and psychology begin."

LORD MORAN suggested that apart from creative work in science and the arts nothing contributed so much to success in life as the gift of selecting men. A few men had this gift but their methods evaded definition—they were too subjective to be taught to others, and we had to seek for more objective tests which could be applied by less gifted men. Had they been found? The average senior soldier or sailor during the war would have replied "No." But perhaps the reason was not so much that psychology was in its infancy as that, a few of those who practised it were in their dotage. Despite Service criticisms Lord Moran felt we would be unwise to reject out of hand any aid to precision. We must remember, Lord Moran continued, that the tests were sub judice. The procedure had been introduced as an emergency measure after the war, not to test knowledge, but wits. Now that the emergency had passed and candidates were presumably coming through the universities again we did not require intelligence tests any longer. If the Stoke D'Abernon weekend was regarded merely as a prolonged interview supplementing examination results, then, Lord Moran held, it was fairer than the short interview of the past. But we must approach the task of measuring men with

humility, and the new personality tests should be used experimentally for a year or two until we saw whether they were reliable or not.

LORD ELTON pointed out that there were no psychologists on any of the 60 or 70 Rhodes scholarship selection committees. He suspected that psychology was a young and tentative science which was making rather exaggerated claims. Lord CHERWELL affirmed that he would rather select a man who did well in an examination on a variety of topics than a man who was good at answering trick questions, joining up pieces to make patterns, or fooling psychologists. This could be done easily once the coaches knew what the psychiatrists were up to.

LORD PAKENHAM, chancellor of the Duchy of Lancaster, said there was every evidence that the Civil Service entrants who had been accepted since the war had fully maintained the pre-war standard. To date the verdict of the Government was that the C.S.S.B. system had admirably served its purpose, and that in the prevailing circumstances it had been a genuine success. But that did not mean that the Government had made up their mind about the desirability or otherwise of retaining the method in peace-time. For 1948 three-quarters of the vacancies for the home Civil Service would be filled by the pre-war method and one quarter by the reconstruction method. The Government would watch results. They had still an open mind about the future of the two methods.

### QUESTION TIME

#### National Service of Students

MR. G. R. CHETWYND asked the Minister of Labour what arrangements were being made to expedite the call-up of persons who reach the age of 18 after June 30 to enable them to be released from the Forces to attend universities in October, 1949.—MR. G. A. ISAACS replied: Arrangements have been made for these young men to apply to be called up before the end of July which should ensure their release from the Forces not later than October, 1949.

#### Remuneration of Doctors

SIR ERNEST GRAHAM-LITTLE asked the Minister if he was aware that general practitioners feel misgivings at the arrangement made for their remuneration out of a central pool, the amount of which is variable and unpredictable; and whether he would apply to medical practitioners the system of payment in accordance with mutual agreements specifying fixed amounts?—MR. BEVAN: No misgivings of this kind have been brought to my notice and the second part of the question does not therefore arise.

#### Recruitment and Training of Nurses

MRS. FLORENCE PATON asked the Minister whether he had received the minority report of the Working Party on the Recruitment and Training of Nurses; and whether he proposed to publish it.—MR. BEVAN replied: Yes, but I would like to make it clear that I cannot interrupt consideration of the questions of policy raised by the majority report which was received nine months ago and on which I have already received the views of the organisations consulted.

#### Rural Water Supplies

Replying to a question Mr. BEVAN stated that 656 water-supply schemes for 3052 parishes at an estimated cost of £23,457,000 were under consideration. In addition, 1061 schemes relating to 2146 parishes at an estimated cost of £12,221,000 had been approved. He had information of 350 completed schemes for 609 parishes at an estimated cost of £1,619,000; the amount of Exchequer grant in respect of these schemes was £46,000. He was unable to state the number of schemes started but not yet completed.

Replying to further questions pointing out the delay in completing these schemes three years after the passing of the Act and asking for priority in view of the possibility of a summer drought, Mr. Bevan admitted that schemes were being completed more slowly than the Government would like. But in comparison with what happened before it was a marathon. Unfortunately a larger number of schemes had been approved by the Ministry of Health than there was steel to complete.

1. Anrep, G. V., Barsoum, G. S., Kenawy, M. R., Misrahy, G. *Lancet*, 1947, i, 557. Ayad, H. *Ibid.*, Feb. 21, p. 305.  
2. Samaan, K. *Quart. J. Pharm.* 1932, 5, 6.

## Obituary

### GEORGE NEWMAN

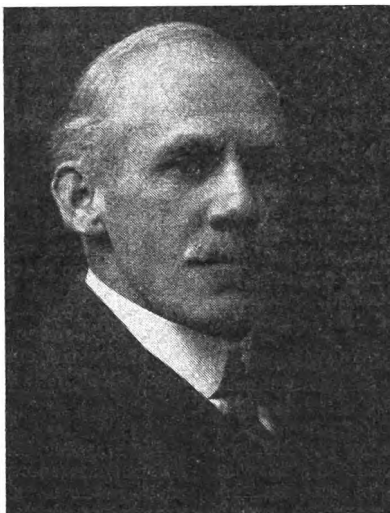
G.B.E., K.C.B., M.D. EDIN.; D.SC., D.C.L., LL.D., F.R.C.P., F.R.C.S.

THIRTEEN eventful years have gone by since Sir George Newman resigned his appointments as chief medical officer of the Ministry of Health and the Board of Education. The end of his life was clouded by illness, and long before his death last week, at the age of 77, his name had passed into medical history—of which he had so strong a sense. Yet some of his achievements are part of our environment, and many will recall the vitality, the intelligence, indeed the genius, that made them possible. At once an official, an artist, and a Quaker, he had a personality as complex as it was brilliant; but whatever its contradictions it secured him great influence through which he served great ends.

George Newman was born at Leominster on Oct. 23, 1870, the second son of Mary Anna Pumphrey and Henry Stanley Newman, for twenty years editor of the Quaker weekly, the *Friend*. He went to school at Bootham, York, and thence to Edinburgh, where he graduated in 1892 and later won the Gunning scholarship in public health. Having taken the Cambridge D.P.H., he became in 1896 senior demonstrator in bacteriology and lecturer on infectious diseases at King's College, London, and for three years was also warden of the Chalfont House settlement. In 1900 he was appointed medical officer of health for Finsbury, one of the 28 metropolitan boroughs constituted by the London Government Act of 1899, and there he soon made a reputation as an energetic and highly efficient officer. His annual reports, informative, full, and readable, appeared, year by year, several months before those of any of his colleagues, and were widely read. The Finsbury post he held concurrently with that of county M.O.H. for Bedfordshire.

In 1907 the Board of Education, under the dynamic influence of Sir Robert Morant, the permanent secretary, decided on a comprehensive policy of school medical care. The post of chief medical officer was offered to Newman, who with characteristic vigour threw himself into the task of shaping this great new development of public-health administration. It began with the establishment of a national scheme of periodical medical inspection of school-children, undertaken by the local education authorities on lines laid down by the board, as a basis for ameliorative medical services. On this foundation Newman and Morant built up, step by step, the impressive system of health services that now safeguard the health of the child at school. Recognising the incompleteness of their efforts so long as the State took no cognisance of the child under five years old, they introduced in 1911-12 the idea of schools for mothers, which eventually emerged as the Maternity and Child Welfare Act of 1918. In his 29 years at the Board of Education Newman did an immense amount to make the public conscious of the need for better care of children: the foundation of national health, he kept saying, is the health of the child.

As one of the principal architects of National Health Insurance, Morant was much concerned to improve the training and equipment of the doctor. Newman accordingly made a special study of the problems of medical education, and when in 1912 the board began to give technical grants to the medical schools he became its medical assessor for the allocation of these grants. His two reports on medical education, the first published in 1918, the second in 1923, are among the most valuable documents ever issued to the public by a government department, and it is interesting to note



[Press Portrait Bureau

the emphasis he was already placing on integration of the preclinical and clinical subjects. He was largely responsible for the report of the Athlone Postgraduate Committee which led to the creation of the London School of Hygiene and Tropical Medicine and the British Postgraduate Medical School at Hammersmith, and he went to the United States to enlist the help of the Rockefeller Foundation in the former project.

In 1919 the constitution of the Ministry of Health by the union of the Local Government Board and the National Health Insurance Commission opened a wider field for the exercise of Newman's energies. He was appointed chief medical officer of the Ministry with the status of secretary—a status higher than any hitherto held by a doctor in the Civil Service and one that gave him direct access to the Minister. He continued to hold his office as chief medical officer of the Board of Education, since it was felt important to coördinate the medical functions of the two medical departments. By that time remarkable advances had been made in

public-health administration. During Sir Arthur Newsholme's term of office at the Local Government Board, national systems for the control of tuberculosis and of venereal disease, and for the promotion of maternity and child welfare, had been established, and, despite the war, extended. Newman's first task was to enlarge and reorganise the medical staff of the newly constituted department so that it should furnish the technical equipment and experience required for its varied and onerous functions. He recognised, however, that legislation and organisation have no value apart from their effects.

"The Ministry of Health," he wrote in 1921, "has, perhaps inevitably, suffered from some of its friends as well as from its enemies. Some of its friends and supporters hailed it as an end in itself, as the goal of their desire, as a species of millennium. They expected too much of it, as its enemies expected too little. It represents a reform in central health government, the establishment of a means rather than an end, the improvement of the machinery of government. It cannot be a substitute for medical science, or for that impulse without which all instruments of government are useless, or for an enlightened public opinion and a national health conscience."

On the other hand, he never underestimated the importance of organisation.

"The nation," he said, "is not receiving the full benefit and advantage of modern medicine. . . . Even in medical practice, many patients who need medical treatment or advice are not getting the best or most effective advice. They are all too often being treated on the same sort of lines as their grandfathers. . . . The time has more than come for taking further steps in the organisation of a systematic and ordered attack on the strongholds of preventable disease—particularly that mass of crippling morbidity and minor invalidism which is undermining the capacity and efficiency of the people. . . ."

He saw that the foundation of a medical service was the general practitioner, who was individualistic in upbringing and in purpose. But every practitioner had duties to the State, and it was inevitable that these should increase rather than decrease, "for the communal value of the practitioner must expand with the development of the solidarity and interdependence of human society."

In taking over National Health Insurance the new Ministry of Health associated, for the first time in this or any other country, the work of the family doctor and the organisation of public health. During Newman's term of office much new legislation was enacted that substantially increased the powers and duties of the

central and local health authorities, the most important measure being the Local Government Act, 1929, which transferred the medical functions of the poor-law authorities to the local health authorities. In these wide extensions of public-health administration he played a large part, not only by his administrative and advisory work at the centre but also by creating a public opinion favourable to new developments. For this purpose he attached particular importance to his annual reports, of which he produced 26 as C.M.O. of the Board of Education, and 15 as C.M.O. of the Ministry of Health. Writing fluently and with point, he could make technical questions clear to the general reader, and he had a gift for interesting the ordinary citizen. Each report was widely reviewed in the lay press and found many readers abroad as well as at home.

Looking back on his long career, it seems that perhaps his best and most fruitful period was at the Board of Education before the first world war. The board was at that time conservative and academic, with little use for medicine or doctors. Young, vigorous, and full of ideas, Newman won the respect of his administrative colleagues by his facility in writing minutes and reports, by his skill in handling difficult local authorities, by his lively conversation, and by his very real administrative ability. He and Morant got on admirably, and formed a most happy partnership. In this earlier period, too, he was still able to find opportunity for the practical work he so much enjoyed—helping people personally through the Adult School movement and the clubs for girls and men connected with the Friends' Meeting House in St. Martin's Lane.

With the war came new official responsibilities: Lloyd George made him a member of the Liquor Control Board, and chairman of the Health of Munition Workers Committee, and he sat on innumerable interdepartmental committees. With all this his reputation grew, and he took to the new Ministry of Health great experience as well as great ability. But essentially he was a solitary worker, not a team-worker, and he was never so happy at the Ministry as he had been among the colleagues he had himself chosen at the Board of Education. He did little to bring the two departments together and he did not get to know the whole of his big staff. Though accessible, he was a little aloof, and he did not assiduously cultivate cordial relations with the administrative side. More and more, as the years passed, he concentrated on his annual reports, which so ably summarised the work of his department; but with improvement in his teaching technique, and mastery of the trenchant phrase, he tended to concern himself more with explaining what should be done than with using his powers to do it. Long official life had also made him inclined to take a rosy view: in the years of slump the nation's medical adviser appeared no more impressed than most of his professional colleagues by the need for positive action to balance the effects of unemployment. In 1932, though he wrote that "the survival, health and physical capacity of a people are clearly more fundamentally necessary than amenities or defence," he followed current opinion in adding: "But that objective must be secured with the smallest possible outlay of public money, and with the most stringent regard to its most economic expenditure." He acquiesced in the policy by which the public feeding of school-children was reserved for those who needed it on medical grounds—a policy reversed only under the stress of war. Yet if, looking back, it seems that in interminable labours the chief medical officer had at last lost something of his exceptional vision, in so far as he had made his colleagues share that vision his work was already done; and it is work for which his fellow-countrymen have cause to be grateful.

He was always a man of untiring mental activity and wide interests. His mind worked rapidly, and he lost no time in coming to a decision.

"Short in stature" (writes Dr. Alison Glover) "he had a fine head with abundant white hair and some resemblance to Lloyd George, a resemblance I suspect he cultivated, for he much admired him. His conversation was vivacious and dramatic, and he could exert great charm. His energy was enormous; living at Hatch End, 14 miles away, he was in the office by nine each morning. He was a master of English,

his letters were a joy and his handwriting beautiful. In speaking he often achieved real and moving oratory. He enjoyed his work, like the true artist that he was, and he enjoyed life, too. One day he took me with him to inspect a small private home in the south, about which questions had been asked in Parliament. Having done our inspection, he pointed to a high Beacon towering above us and said: 'Alison, my boy, let's have our lunch on top of that'; and, though I was six years younger, he beat me easily in the steep ascent which delighted him.

"The influence of his writings on modern public health was great and lasting, especially on its more personal side. His *Hygiene and Public Health* (1917) was well in advance of its time, and his *Outline of the Practice of Preventive Medicine* (1917) and *The Building of a Nation's Health* (1939) are landmarks. His annual reports, with their aptly chosen titles, are classics, and were the spades with which he extended the highroad of public health. Today, if one wants a telling phrase or text for almost any public-health subject, the surest mines in which to delve are Newman's writings.

"To me he was an inspiring chief and always a most kind friend."

Sir Arthur MacNalty, who succeeded him as C.M.O., recalls that in planning the staff of the medical department of the Ministry of Health, he gave due weight to the claims and work of the assistant medical officers and medical inspectors of the Local Government Board. Having to deal with wide issues, he allowed his senior medical officers full scope in their respective spheres of work, although he was always available to discuss important questions and decisions with them.

"He was an expert diplomatist and knew the times when to give or to avoid a decision. As an instance, I remember his interview with an important medical officer of health who was anxious to obtain a ruling on a question which exercised his council and which the Ministry found embarrassing. Sir George received his caller with cordiality, explained that he could only give him ten minutes, and then proceeded to tell a series of amusing anecdotes in which he mimicked the great persons of the day. At the end of the time, Sir George looked at his watch, shook hands with the medical officer, and saying: 'My dear fellow, the Minister has been waiting for me twenty minutes,' darted out of the room before the awkward subject could be entered on.

"He was an indefatigable worker, but he sometimes complained to me of the monotony of a chief medical officer's desk work, 'shoving papers from one fusty box to another,' as he expressed it. In his literary work and his annual reports, adorned with pregnant phrases and quotations, he maintained the traditions of his predecessors, Simon and Buchanan."

Another former colleague speaks of his "unfailingly buoyant and cheerful temperament, his enormous zest for life and work, and his great gift of humour, which continually welled up and overflowed in his conversation, making him one of the most delightful of companions."

His home, with its five acres of garden and woodland, was very quiet and simple. Even at weekends he spent much time in writing, and outside his official work he edited anonymously, for forty years, the *Friends' Quarterly Examiner*. In finding this "retirement of spirit" he owed much to his wife, Adelaide Constance Thorp, a woman of singular quality and an artist. She died in 1946, and there were no children.

For many years Sir George Newman was a member, as Crown nominee, of the General Medical Council, and he served as its treasurer. He was knighted in 1911, and was appointed K.C.B. in 1918 and G.B.E. in 1935. His honorary degrees included the D.Sc. of Oxford, the D.C.L. of Durham, and the LL.D. of London, Edinburgh, McGill, Toronto, Glasgow, and Leeds; the Society of Apothecaries of London made him an honorary freeman, and the Royal College of Surgeons an honorary fellow in 1928. He was also a fellow of King's College, London, and an honorary fellow of the New York Academy of Medicine. He received the Bisset Hawkins medal of the Royal College of Physicians in 1935, and the Fothergill gold medal of the Medical Society of London. He was emeritus lecturer on public health at St. Bartholomew's Hospital, and at various times delivered the Yale, Linacre, Gresham, Halley Stewart, and Heath Clark lectures.

**GEORGE FRANCIS BLACKER**

KT., C.B.E., M.D. LOND., F.R.C.P., F.R.C.S.

Sir George Blacker, consulting obstetric physician to University College Hospital, died at his home at Frensham, Surrey, on May 21.

The third son of Major-General Latham Blacker, he was born in Dublin in 1865, and educated at Cheltenham College and at University College and University College Hospital, London, where he proved himself as a scholar and exhibitor. In 1890 he qualified, and the following year he graduated M.B. with first-class honours, and was awarded the gold medal, a distinction he also received for his M.D. thesis two years later. In 1891 he



took the F.R.C.S., and he was appointed the same year Atkinson Morley surgical scholar. The promise of these student years he amply fulfilled, and choosing obstetrics and gynaecology as his specialty he was soon appointed to the staff of his own hospital, later becoming lecturer in midwifery at the medical school. He also joined the staff of the Royal Northern Hospital. In 1902 he was elected F.R.C.P.

His period as dean covered the eventful years after the war of 1914-18 when University College Hospital was one of the schools to accept the

opportunity offered by the Board of Education, largely at Sir George Newman's instigation, to reorganise its teaching on the clinical unit system. This courageous innovation attracted to the school and college in 1920 the munificent gift of over a million pounds from the Rockefeller Foundation, which had long supported this system of teaching.

Blacker's interest in medical education—this time as applied to his own specialty—was further shown by his membership of the committee which, under the chairmanship of Watts Eden, presented to the section of obstetrics and gynaecology of the Royal Society of Medicine a report on the teaching of these subjects in London. To raise the standard of training the committee proposed a large increase in hospital accommodation for midwifery cases by the creation of centres where the students could gain practical experience under skilled supervision. They also urged that training in the management of infants might appropriately be associated with these new centres. At the discussion on the report held at the section, over which he had presided from 1917 to 1918, Blacker strongly upheld these proposals. But he was not only interested in the administrative problems of teaching, and he was much in demand as an examiner, serving in this capacity the Conjoint Board and the universities of London, Liverpool, and New Zealand.

During the 1914-18 war he served as a captain with the R.A.M.C. and was twice mentioned in despatches. After the war his interest in the work of the Red Cross continued and he became an honorary life member of the society. In his gynaecological work he was interested in the use of radium, and in 1929 he became president of the Radium Institute, and later a vice-president of Mount Vernon Hospital.

As a writer Blacker knew how to marshal facts with lucidity and impartiality, and these qualities were shown to advantage in his presentation of the merits and demerits of twilight sleep to the Hunterian Society in 1918, and in the many reviews which he contributed to the textbooks of his time. In the *New System of Gynaecology*, for instance, he wrote on ectopic gestation, in the *Encyclopædia of Diseases of Women* on antepartum and postpartum hæmorrhage, in *Latham and English's System of Treatment* on menorrhagia. He also published in 1922 a review of the limitations of caesarean section, and in 1910 he collaborated with Dr. Galabin in preparing the seventh edition of his *Practice of Midwifery*.

He married in 1904 Shirley Elvina, daughter of Canon T. J. Bowen, of Bristol, and they had one son. He was appointed C.B.E. in 1920, and was knighted three years later.

**Notes and News****PLAIN FACTS FOR THE PLAIN MAN**

Nobody would accuse Somerset House of hiding its light under a bushel, and what with the weekly return, the quarterly return, the annual review, and the decennial supplement one might think that all tastes (and pockets) were provided for. But these admirable publications are not light reading; as the Registrar-General puts it "... it isn't too easy for the plain man to find his way through them..." So Mr. George North, LL.D., and his colleagues at the General Register Office have published a short simple statement<sup>1</sup> of the main facts about life, death, health, and disease in England and Wales—an epitome of vital statistics, shorn of footnotes, parentheses, and qualifications—for sixpence. Though much of it will be familiar to doctors, they will find it stimulating reading for a spare half-hour, and handy for reference. A popular booklet on this model should be at least an annual production, and it might well include an up-to-the-minute commentary on the findings of the Sickness Survey.

**NORTHERN IRELAND MENTAL HEALTH BILL**

THIS Bill, introduced as a corollary to the Health Services Act, is intended to improve and extend the mental health services. The new measure provides in particular for the care of mental defectives, and to this end capital expenditure of up to £500,000 on a special colony is contemplated. By existing law a patient may enter a mental hospital as a voluntary patient, as a temporary patient, or by virtue of a judicial order as a person of unsound mind. In future all patients will enter either voluntarily or as temporary patients; those in the second group will be admitted on the recommendation of only one doctor and may be treated in this category for up to 2 years. After admission to hospital patients may be certified as of unsound mind by a judicial authority.

**MEDICAL SICKNESS SOCIETY**

THE Medical Sickness, Annuity, and Life Assurance Society, with 10,739 members and funds amounting to £3,719,071, had another record year in 1947. The premium income increased to £381,547, of which 10.87% was taken up by the cost of administration. Nearly half of the funds is invested in British Government securities; the average gross rate of interest for the year was £3 14s. 3d. %. The society is issuing an increasing number of the new combined guaranteed annuities, which provide a guaranteed payment for a fixed term of years even though the holder may not survive the period; during these years income-tax is payable only on the interest included in the annuity, which is a fairly small proportion of the total. At the end of the guaranteed term an annuity of approximately the same net amount is payable for the rest of the lifetime.

**APPEAL BY BRITISH EMPIRE CANCER CAMPAIGN**

A SPECIAL appeal for £1,000,000 to mark the 25th anniversary of the campaign was launched by the Duke of Gloucester at the Mansion House on May 24. The money is needed in order to take advantage of the revolutionary scientific advances made during the war. Donations should be sent to the hon. treasurer at 11, Grosvenor Crescent, Hyde Park Corner, London, S.W.1.

**SHOES FOR THE CHILD WITH FLAT FEET**

THE Start-rite Shoe Company, impressed with the prevalence of flat-foot among children of all ages, is making a new 'Inneraze' shoe which aims at providing complete and automatic correction of the everted hindfoot without giving any impression that a surgical shoe is being worn. The correction is obtained by inserting a wedge between the inner and outer soles along the inner margin of the shoe from the heel to just behind the first metatarsal head; and the tendency to rolling over on and wearing down the outer side of the heel, which the usual external wedge produces, is compensated by having a rather high and close-fitting upper, with a special stiffening, and by floating out the outer border of the heel. The old custom of wedging the heel itself was no doubt unsatisfactory, for it gave an unstable rocking bearing surface (unless the forepart of the shoe was vigorously moulded into pronation), and the ordinary upper yielded so much as to make any wedging unreliable unless applied to a boot. The new

1. *Matters of Life and Death*. H.M. Stationery Office. 1948. Pp. 20. 6d.

shoes, which are now, like all children's shoes, coupon-free, will be obtainable at all Start-rite agents, but only on a doctor's prescription.

The manufacturers have also produced a short film which illustrates simply and attractively the anatomy and physiology of the everted foot, and though this is frankly an advertising enterprise, the information it offers will be useful to doctors and easily assimilated by all auxiliary medical personnel and school health workers. It is to be shown to doctors in London on June 22, and tickets may be obtained from the managing director, James Southall & Co. Ltd., 34, St. George's Street, Hanover Square, London, W.1.

#### PARENTS' QUESTIONS

THE members of the Child Study Association of America<sup>1</sup> have revised and added to the earlier edition in which they answered the questions of parents puzzled by the behaviour of their children. Answers cover the whole range of childhood, and are divided into arbitrary sections. Each section has an introduction and most sections end with a clinical story; both make good reading. The fact that the parents are American makes remarkably little difference: English parents of the same group—that is, benevolent and rather informed parents—ask the same kinds of question.

But the main value of the book is in the attitude of the editors. They accept the necessities, the actualities, and difficulties of life for both parents and children. There is a total absence of aggressiveness, and much wisdom.

Many parents feel that in asking for advice they are confessing to failure in themselves; but inquiry is far more often a sign that the parent is conscientious, loving, and aware of the increasing complexity of life in a community in which small families have become the rule, thus creating new problems.

#### DEATH OF A TRANSFIXIONIST

Mirin Dajo, the Dutchman who claimed that he had been transfixed with a sword 500 times (see *Lancet*, 1947, ii, 523) did not survive long after our remark (April 10, p. 567) that his was a dangerous accomplishment. According to the *Daily Telegraph* of May 31, a dagger-point which he swallowed some time ago has caused a fatal perforation of the œsophagus.

#### University of Birmingham

Prof. John F. Fulton (Yale University) is to deliver the William Withering lectures in the anatomy theatre of the medical school at 4 p.m., on June 7, 8, 9, and 10. He will speak on Functional Localisation in the Frontal Lobes and Cerebellum with particular reference to frontal leucotomy. The lectures will be as follows: (1) the precentral motor cortex; (2) the frontal areas in subhuman primates; (3) the frontal areas in man; and (4) the cerebellum reconsidered.

#### British Postgraduate Medical Federation

Prof. H. J. Seddon has been appointed director of studies of the Institute of Orthopædics and clinical director of the Royal National Orthopædic Hospital, London.

Professor Seddon, who is 44 years of age, was educated at Hulme Grammar School, Manchester, and St. Bartholomew's Hospital. He was awarded the gold medal when he took his M.B. in 1925, and in the same year he took the F.R.C.S. While holding house-appointments at Barts he was also for a time registrar at the Royal National Orthopædic Hospital. In 1930 he was appointed to an instructorship in surgery at Ann Arbor, Michigan, under Prof. Hugh Cabot and Dr. Vernon Hart. The following year he returned to Barts as chief assistant in the orthopædic department, and a few months later he became resident surgeon at the Stanmore branch of the Royal National Orthopædic Hospital, where he held demonstrations and supplementary classes in orthopædics for the students from four London hospitals. In 1940 Mr. Seddon was appointed to the Nuffield chair of orthopædic surgery in the University of Oxford and received the degree of D.M. He also became surgeon to the Wingfield Morris Hospital. In 1933 he had won the Robert Jones gold medal of the British Orthopædic Association for his essay on Pott's paraplegia, and in 1935 he had delivered a Hunterian lecture on caries of the thoracic spine. During the war his published work dealt chiefly with the surgery of nerve injuries. In 1943 and 1945 he visited Malta and Mauritius at the request of the Colonial Secretary to advise on the outbreaks of poliomyelitis, and he is a member of the Colonial Medical Advisory Committee. He was also a member of the Ministry of Pensions departmental committee on artificial limbs (1944-45).

#### British Association of Urological Surgeons

The annual meeting will be held in London from June 24 to 26. Further particulars may be had from Mr. E. W. Riches, the hon. secretary, 45, Lincoln's Inn Fields, W.C.2.

1. Parents' Questions. 2nd ed. London: Gollancz. 1947. Pp. 285. 10s. 6d.

#### West London Medico-Chirurgical Society

Prof. E. N. da C. Andrade, D.Sc., F.R.S., will deliver the Cavendish lecture on Tuesday, June 15, at 8.30 p.m., at 1, Wimpole Street, W.1. He is to speak on the Atom and its Energy.

#### Institute of Laryngology and Otolaryngology

On Monday, June 28, at 5.30 p.m., Dr. Arthur Proetz, of St. Louis, Missouri, will lecture at the institute on Medical and Surgical Treatment in Relation to the Physiology of the Nose. Application for admission should be made to the secretary of the institute, 330, Gray's Inn Road, London, W.C.1.

#### International Congress in the Pyrenees

An international congress on sulphur will be held at Cauterets in the High Pyrenees from Sept. 13 to 15 under the presidency of Prof. Maurice Loeper. Further particulars may be had from Dr. Bernard Mothe, 12 rue Duplax, Pau (Basses-Pyrénées), France.

#### Increase for Some Old-age Pensioners

Old-age pensioners now drawing contributory pensions of 26s. a week become eligible on July 5 for an increase of 16s. a week if they have a dependent wife under the age of 60. Claims should be made before June 5 on form T.S.2, which together with an explanatory leaflet T.S.35, is available at all area offices of the Assistance Board and at local National Insurance offices.

#### Casualties Union

A demonstration of the make-up of casualties will be given at the annual reunion to be held on Sunday, June 20, at 2.30 p.m., at Nine Elms Goods Depot, near Vauxhall Station, London, S.W.8. There will also be open competitions in first-aid and in diagnosis. Those who are interested in realistic aids to first-aid training may obtain tickets from Mr. R. W. Pitts, Wix Hill House, Epsom Road, West Horsley, Surrey.

#### Imperial Cancer Research Fund

A meeting of the council of the fund was held on May 25, when Prof. H. R. Dean was re-elected chairman. Sir Alfred Webb-Johnson was elected a life governor in recognition of his services to the fund. It was reported that Lord Amulree had been appointed an elected member of the council by the governors. Dr. L. Foulds was re-elected Elizabeth Wills Allen fellow, and Dr. Beatrice Pullinger was re-elected Alice memorial fellow.

#### Safer Motherhood

A public meeting on this subject is to be held by the Married Women's Association, the National Birthday Trust Fund, and the National Federation of Women's Institutes at Caxton Hall, Westminster, S.W.1, on Tuesday, June 8, at 7 p.m. Sir Eardley Holland will speak and will afterwards lead a team of experts, including Miss Josephine Barnes and Dr. Geoffrey Organe, in a "brains trust" discussion. Dr. Charles Hill will act as question master.

#### Society of Individualists

Speaking to this society on May 20, on the National Health Service Act, Lord Horder said that he had been protesting against the nationalisation of medicine since the beginning of 1945. In the domination of medicine by the State he saw a greater danger than in its domination by the Church in the Middle Ages, for the Church at least was cultured. He deplored the sudden impact of a crude amateur group of doctrinaire politicians on the slow development of medicine. Those who would buy security at the price of liberty deserved, as Benjamin Franklin had said, neither liberty nor safety. The doctors had been outwitted by a political manoeuvre, for they had only received verbal assurances which amounted to little more than a promise that they would not lose all their liberty at once. But as long as the Minister possessed such complete power he could turn the screw until freedom was lost. This centralisation of power in the hands of one man, Lord Horder continued, had been the text of his warning for years. Important though they were, he had not the same interest in the other points put forward—such as negative direction, appeal to the court, and remuneration. They were the sign-manual of the doctors' freedom but the real danger lay in the centralisation of power, which ran like a thread through the whole Act.

Sir Ernest Graham-Little was in the chair.

**Royal Medical Benevolent Fund**

The 112th annual general meeting will be held at 11, Chandos Street, London, W.1, on Tuesday, June 29, at 5 P.M., when Sir Alfred Webb-Johnson, the president, will be in the chair.

**Return to Practice**

The Central Medical War Committee announces that Mr. Philip Reading, M.S., F.R.C.S., has resumed civilian practice at Keats House, St. Thomas's Street, London, S.E.1 (Hop 0151).

**Genetics of Cancer**

The Genetical Society of Great Britain and the British Empire Cancer Campaign, are holding a symposium in London on this subject on June 24 and 25, at 1, Wimpole Street, and 11, Chandos Street, W.1. The subjects for discussion include: Inheritance of Cancer in Man and Animals; Virus and Carcinogen-induced Mutations. Further information may be had from Dr. R. R. Race, Lister Institute, Chelsea Bridge Road, S.W.1. Application for tickets for the dinner which will take place on June 24 should be made to Dr. P. C. Koller, Chester Beatty Research Institute, Royal Cancer Hospital, Fulham Road, S.W.3, not later than June 14.

**Appointments**

CRANER, A. S., M.R.C.S., D.M.R.: radiologist, East Ham Memorial Hospital.  
GIBSON, H. J., M.B. Edin.: M.O., student health scheme, St. Andrews University.  
LUSH, B. S., M.B. Lond., M.R.C.P.: physician-in-training, unit of rheumatology, Royal Free Hospital, London.  
MATH, W. F., M.D. Edin.: M.O., student health scheme, St. Andrews University.  
SHANNON, D. W., M.B. Edin., D.A.: specialist anaesthetist, Royal Edinburgh Hospital for Sick Children.

**St. Andrew's Hospital, Bow, E.3:**

SMITH, W. D., M.B.: casualty officer.  
WOOD, J. F. H., M.B. Glasg.: house-physician.  
ZAMLER, J., M.R.C.S.: house-physician.

**Colonial Service:**

BROWNE, D. J., M.B. Lpool.: M.O., St. Vincent.  
BUTLER, G. C., M.B. N.U.I.: M.O., Nigeria.  
HENDERSON, R. R., M.B.: M.O., Kenya.  
LASHIZ, BOLESZAW, M.D. Poznan.: M.O., British Somaliland.  
SANKERALLI, E. J., M.D. Belf., D.T.M., D.P.H.: director of medical services, Trinidad.  
WEATHERHEAD, H. D., M.R.C.S., D.T.M. & H.: director of medical services, North Borneo.

**Births, Marriages, and Deaths****BIRTHS**

BROUGHTON.—On May 30, in London, the wife of Dr. David H. Broughton—a daughter.  
DINNICK.—On May 22, in London, the wife of Dr. O. P. Dinnick—a daughter.  
EARLAM.—On May 21, in Liverpool, the wife of Dr. Francis Earlam—a daughter.  
FORD.—On May 23, at Swasey, Cambs., the wife of Dr. A. R. Ford—a daughter.  
HELM.—On May 27, at Plymouth, the wife of Dr. Cyril Helm, D.S.O., O.B.E., M.C.—a son.  
HEWAT-JABOOR.—On May 24, at Wellington, the wife of Dr. D. Hewat-Jaboor—a daughter.  
JOHNSON.—On May 14, in Manchester, the wife of Mr. Richard T. Johnson, O.B.E., F.R.C.S.—a daughter.  
MILNE.—On May 21, at Newquay, Cornwall, the wife of Dr. R. I. Milne—a son.  
PAGE.—On May 24, in London, the wife of Mr. B. H. Page, F.R.C.S.—a son.  
SKINNER.—On May 23, at Oxford, the wife of Dr. Ian Skinner—a son.

**MARRIAGES**

BINNING—REPARD.—On May 27, at Hove, Rex Binning, M.R.C.S., to Nancy Louise Repard.  
GARDNER—DOUGLAS.—On May 22, at Northchurch, David Lewis Gardner, to Joy Marjorie Douglas, M.B.  
LEWIS—THIRD.—On April 3, at Aberdeen, George A. Lewis, M.B., to Sheila Third, M.B.

**DEATHS**

BLACKER.—On May 21, at Frensham, George Francis Blacker, KT., C.B.E., M.D. Lond., F.R.C.P., F.R.C.S.  
DAVEY.—On May 25, at Bampton, Oxon, Thomas Ronald Davey, M.R.C.S., aged 62.  
NEWMAN.—On May 26, George Newman, G.B.E., K.C.B., M.D. Edin., F.R.C.P., D.P.H., aged 77.  
SIKES.—On May 25, at Portscatho, Cornwall, Alfred Walter Sikes, D.S.O., M.D. Lond., F.R.C.S., M.R.C.P., D.P.H., aged 78.  
SMITH.—On May 26, at St. Albans, James Johnston Smith, M.B. Glasg.  
TUKE.—On May 25, at Dunfermline, Alan Leonard Smith Tuke, M.C., M.B. Edin., F.R.C.P.E., D.L.

**Diary of the Week**

JUNE 6 TO 12

**Sunday, 6th**

LONDON JEWISH HOSPITAL MEDICAL SOCIETY  
3 P.M. (Woburn House, W.C.1.) Mr. Hamilton Bailey: Some Clinical Entities Frequently Misdiagnosed.

**Monday, 7th**

ROYAL COLLEGE OF PHYSICIANS, Pall Mall East, S.W.1  
5 P.M. Prof. J. Crighton Bramwell: Bacterial Endocarditis.  
ROYAL COLLEGE OF SURGEONS, Lincoln's Inn Fields, W.C.2  
5 P.M. Prof. Ian Aird: General Approach to Children's Surgery.  
WESTMINSTER HOSPITAL, Horseferry Road, S.W.1  
5.30 P.M. (Meyerstein lecture theatre.) Clinico-pathological demonstration on whooping-cough.

**Tuesday, 8th**

ROYAL COLLEGE OF PHYSICIANS  
5 P.M. Professor Bramwell: Cardiac Enlargement.  
ROYAL COLLEGE OF SURGEONS  
5 P.M. Mr. Charles Donald: Surgical Conditions in the Neck in Childhood.  
RESEARCH DEFENCE SOCIETY  
3.15 P.M. (26, Portland Place, W.1.) Prof. P. A. Buxton, F.R.S.: Tsetse Flies and the Development of Africa. (Stephen Paget lecture.)  
BRITISH ASSOCIATION OF PHYSICAL MEDICINE  
2.30 P.M. (Hospital for Sick Children, Great Ormond Street, W.C.1.) Dr. F. B. Klerander: Clinical demonstration of physical medicine in children.  
INSTITUTE OF DERMATOLOGY, 5, Lisle Street, W.C.2  
5 P.M. Dr. F. R. Bettley: Occupational Dermatitis.

**Wednesday, 9th**

ROYAL COLLEGE OF SURGEONS  
5 P.M. Mr. Harold Edwards: Pyloric Stenosis and Mirschsprung's Disease.

**Thursday, 10th**

ROYAL COLLEGE OF PHYSICIANS  
5 P.M. Dr. Janet Vaughan: Transfusion of Blood and Blood Substances.  
ROYAL COLLEGE OF SURGEONS  
5 P.M. Mr. T. Twistington Higgins: Surgery of the Upper Urinary Tract.  
ROYAL SOCIETY, Burlington House, Piccadilly, W.1  
4.30 P.M. Prof. V. B. Wigglesworth, F.R.S.: Insects as a Medium for the Study of Physiology. (Croonian lecture.)  
WEST LONDON HOSPITAL, Wolverton Gardens, W.6  
8.30 P.M. Mr. Norman Tanner: Haematemesis and Melæna. (Alex Simpson Smith lecture.)  
INSTITUTE OF DERMATOLOGY  
5 P.M. Dr. L. Forman: Tuberculous Infections of the Skin.

**Friday, 11th**

ROYAL COLLEGE OF SURGEONS  
5 P.M. Mr. J. Mason Brown: Traumatic Surgery, including Burns and Scalds.  
ROYAL COLLEGE OF OBSTETRICIANS AND GYNÆCOLOGISTS, 58, Queen Anne Street, W.1  
2.15 P.M. Prof. N. C. Louros (Athens): Accelerated Painless Labour.  
UNIVERSITY OF LONDON  
4.30 P.M. (University College Hospital Medical School, W.C.1.) Dr. Oliver Cope (Harvard): Burns and Fluid Balance. (Holme lecture.)  
NATIONAL HOSPITAL, Queen Square, W.C.1  
5 P.M. Prof. John Fulton (Yale): The Cerebellum Reconsidered.  
FACULTY OF RADIOLOGISTS  
11 A.M. (Royal Infirmary, Cardiff.) *Diagnosis section.* Prof. Jethro Gough, Dr. C. M. Fletcher, Dr. L. G. Blair: Pneumoconiosis in South Wales.  
2.15 P.M. *Therapy section.* Dr. R. Bodley Scott, Dr. H. B. May, Dr. J. S. Fulton: Treatment of the Leukæmias.

**Saturday, 12th**

FACULTY OF RADIOLOGY  
10 A.M. (Institute of Engineers, Cardiff.) *Diagnosis and therapy sections.* Dr. M. H. Jupe, Prof. Dorothy Russell, Mr. Brodie Hughes, Mr. J. Jackson Richmond: Cerebral Tumours.

The title of the Wholesale Drug Trade Association has been changed to the Association of British Pharmaceutical Industry.

A delegation of nine specialists from Czechoslovakia arrived in this country on May 26 for a week's stay at the invitation of the British Council and the Royal Society of Medicine.

Mr. R. W. Raven will be leaving England on June 12 to address the Roman Surgical Society, and afterwards, on behalf of the British Council, to lecture at the medical schools of Florence, Bologna, Milan, and Turin.

**CORRIGENDUM.**—The degrees of Dr. W. E. Snell (*Lancet*, May 22, p. 791) should have been given as M.A. Camb., M.D. Lond.



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## THE CONTROL OF INFECTION IN BURNS

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SEVENTY years ago sepsis was expected to follow almost every "clean" operation. Acting on what was then known (and surmised) about the probable source of those infections, an aseptic and antiseptic ritual was evolved by surgeons, led by Lister, for operative surgery. In a few years it completely changed the picture.

A little reflection should have shown the surgeons that the infections of burns had similar origins to those of the operating-theatre, and might be expected to yield, at least in some measure, to a similar mode of attack. Though the ritual might have to be still more strict, because burns offer such a large area to infection from the air and have to be exposed many times, the principles would be the same.

But that line of attack was never tried. The technique of dressings was often grossly at fault, and the burns continued to be dressed in open wards, where the air is known to be often contaminated with pathogenic bacteria, right up to now. In only one or two recent reports (Langohr et al.<sup>16</sup>) is there mention of burns being nursed in cubicles and dressed in an operating-theatre.

Since 1940 the war and the introduction of sulphonamides and penicillin have given a new impetus to the fight against septic infection generally.<sup>3 10 11 18 19 25 28</sup> During the war McKissock, Wright, and Miles<sup>17</sup> showed that with a sufficiently strict dressing technique the incidence of sepsis could be reduced considerably, even when patients were dressed in the wards. With burns, which often present a very large infectable surface difficult to keep perfectly covered and needing repeated dressings, much stricter precautions must be taken. At the Glasgow Royal Infirmary during 1942-43 Colebrook and his colleagues<sup>6</sup> showed that, though the introduction of a strict technique of dressings in the wards could reduce the incidence of cross-infections by streptococci very considerably, about 30% of the patients still acquired these organisms at some period of their stay in hospital.

At the Birmingham Accident Hospital since the beginning of 1945 a serious attempt has been made for the first time to treat burns under conditions which aim at eliminating not only the "contact" infections (from hands, instruments, &c.) but also airborne infections. The conditions have not been ideal; for, though a specially ventilated room has been available for the dressings, making it possible to expose the burns only in clean air, it has been impossible to nurse infected cases in well-ventilated single wards and, owing to the shortage of nurses, to carry out efficient barrier nursing. For long periods this shortage was so acute that we were obliged to employ untrained help in the wards.

The results obtained during the first one and a half years have already been reported (Bourdillon and Colebrook,<sup>4</sup> Colebrook et al.<sup>7</sup>). In the present survey a further one and a half years are included; the results are summarised and compared with those reported elsewhere, and the requirements for further progress are discussed.

## CLINICAL MATERIAL, DEFINITIONS, AND METHODS

In 1945-47 734 patients of either sex with burns and scalds have been admitted to the burns unit—nearly

half of them children. About 90% of them were admitted on the day of the accident. Their stay in hospital (including periods for readmission of a few patients for secondary repair operations) averaged about 40 days, but was several days less than that in 1947. The over-all mortality was 4.7% (but only 2.6% for patients under the age of 65).

Patients were housed in a ward for 16 men, another ward, partially divided, for 8 women, and a children's ward, which was subdivided in 1946 to provide three two-bed enclosed cubicles and three open compartments accommodating 12 (or occasionally 14) cots. Ward floors were treated with spindle oil every three weeks, and blankets were oiled and sterilised by low-pressure autoclaving (5 lb. for 20 min.) after the discharge of each patient, or at the discretion of the ward sister.

## DEFINITIONS

In this report the term "infection" by itself is used throughout in a bacteriological rather than a clinical sense. Where necessary it is qualified by the addition of "silent," to imply the absence of clinical signs and symptoms; or by "manifest" or "acute" when it is accompanied by such signs and symptoms. The term "added infection" connotes the recovery of one of the three "indicator organisms"—i.e., hæmolytic streptococcus (group A), *Ps. pyocyanea*, or *B. proteus*—from a wound, that organism not having been found on any of the patient's burned areas on admission. It is really the equivalent of "acquired in hospital." An inquiry in each instance of "added infection" (on the lines indicated by Bourdillon and Colebrook<sup>4</sup>) sought to determine whether the infection had been acquired at the time of dressing the wounds or at some time between one dressing and the next—i.e., in the wards. Though the incidence of staphylococcus infection is noted, no attempt was made to trace the added infections by this organism.

## METHOD

The treatment of burned surfaces was substantially the same throughout the three-year period—by "open" rather than occlusive dressings, infrequently changed. Briefly, the wounds were cleaned with cetyltrimethylammonium bromide ('Cetavlon,' i.c.i.), and penicillin cream was applied (200 or 400 units per g. in a 'Lanette wax' and castor-oil base). Great care was taken to obtain perfect covering of the burns, and skin replacement was carried out for the deeply burned areas at an early stage. Penicillin and the sulphonamides were seldom given systemically. Dressings were done by a team of three, wearing sterile gowns, head-covers, and masks, and clean canvas overshoes. All the dressings except the first (plenary) were done in a specially designed room continuously supplied with an abundant stream of twice filtered and warmed air (1000 c. ft. per min.) which escaped by a single exit carrying with it any particles and bacteria which had been liberated from the patients' bandages, &c. An interval of 5 min. was allowed between one patient's dressings and the next, for recleaning the air. (The treatment of shock will be described elsewhere. It has been chiefly by fluid replacement with plasma or with serum.)

The methods used in studying the incidence of infections have been as follows:

The bacterial flora of each separate burned area was determined on admission and at each subsequent dressing. Sometimes several samples were taken from different parts of a large area covered by a single dressing, and not infrequently they yielded different results. All these swabs have been planted on a sector of a blood-agar plate, and on another sector of a 1% cetavlon-agar plate or, recently, on a blood-cetavlon-agar plate (Hood<sup>18</sup>) for the detection of *Ps. pyocyanea*. Anaerobic methods of cultivation have been used only occasionally when no growth took place on aerobic plates and there was reason to suspect an infection, or when

\* Receiving a part-time grant from the Medical Research Council.  
† Receiving a whole-time grant from the council.

organisms were seen in a film from the wound but no growth was obtained aerobically.

When proteus was known or suspected to be present, the culture method described by Cawston<sup>5</sup> was used or, recently, that of Pearce.<sup>22</sup>

The Lancefield group of  $\beta$ -haemolytic streptococci was determined, together with the type reaction of all those belonging to group A. Only cocci giving a positive coagulase reaction have been included as *Staph. aureus*.

Besides the routine wound swab, a tonsil swab has been taken from almost all cases on admission for the detection of haemolytic streptococcus, and in groups of cases from the nostrils and healthy skin for the detection of *Staph. aureus*. Invasive infections, with high fever, have occurred so rarely that blood-culture has seldom been required. Only once was a septicæmic infection discovered (*Strep. viridans*) in a case of endocarditis.

All this bacteriological work has involved the handling of some 5000 swabs each year.

#### SURVEY OF INFECTIONS IN THE BURNS UNIT (1945-47)

##### Infection by $\beta$ -Haemolytic Streptococcus (Group A)

The outstanding feature of our experience is that for three years it has been possible to eliminate almost completely clinically manifest infections by these streptococci and to reduce the "silent" infections to very few. The data are as follows:

Of the 734 cases admitted 29 (3.9%) had already an infection by haemolytic streptococcus, usually with some local inflammation and a little fever. None of them was seriously ill. In no case did the infection become invasive or lead to septicæmia and/or other complications. The streptococci were eliminated in almost every case within a few days by local application of penicillin cream repeated at two-day intervals.

Of the remaining 705 cases only 38 (5.4%) acquired an infection of this kind at any time during their stay in hospital. In a six-month period in 1947 only 1 of the 190 cases admitted without streptococcus infection of the burns acquired these organisms—and that one had them only on a single swab. During that period 3400 swabs were examined.

Most of the "added infections" by this organism were of the "silent" type—without local or general signs and symptoms. In no instance was the infection of the invasive type. The streptococci appeared in most cases comparatively late in the course of recovery. In only 14 cases did the streptococci appear within the first two weeks.

On the few occasions when streptococci were present on a wound at the time of skin grafting (care was taken to avoid this as a rule) the "take" was poor or nil.

##### Infection by *Ps. pyocyanea*

Only 13 patients (1.8%) had *Ps. pyocyanea* on their burns on admission to hospital, and none of these 13 was admitted within a few hours of the accident. Of the remaining 721 patients 60 acquired this organism in hospital (8%), but the distribution of these added infections was not uniform. In the first two and a half years of the work of the unit only 31 patients acquired this infection (5.8%), but during the second half of 1947 we have to admit, with regret, our failure to control the spread of this organism. No less than 29 (16%) of the patients admitted during the six-month period have acquired it. This greater infection-rate coincided with a 50% increase in the turnover of patients with (often) some overcrowding, particularly in the children's ward.

Examination of the records seems to make it clear that transmission of the infection in every case except three has taken place in the wards between dressings—not in the dressing-station, and that there has been a close correlation between these added infections and imperfect covering of the wounds.

There is much still to be learned about the spread of *Ps. pyocyanea* in a ward. We have never isolated it from the throat or nose swabs from any member of the staff of the unit or from any patient (more than 1000 swabs examined). It was present for a few weeks in the chronic discharge from an ear of one patient, but there was no evidence that it spread from him. Many wet swabs have been taken from the bedding of pyocyanea-

infected patients and from the furniture, floor, and walls near their beds. Sometimes these have yielded pyocyanea but more often they have been negative. The air in the vicinity of infected patients, when sampled either by the Bourdillon "slit sampler" or by "settle" plates near the beds, has usually given no growth of pyocyanea or at most only one or two colonies. Unpublished experiments by J. E. Lovelock have shown that this organism is very sensitive to drying when sprayed into the air, but we found that it survived in the laboratory for several weeks when dried on glass or on cotton-wool swabs, even if these were kept in daylight. The possible transmission by flies—e.g., from half-covered burns of the face—is now being investigated. One of the first six flies to be captured in the ward was carrying pyocyanea.

Pending further evidence it appears to us probable that dissemination of this organism is chiefly by the medium of dust (and probably flies) and that infection can be initiated by small numbers.

In the course of this epidemiological investigation our attention has been directed to one possibility that is usually overlooked. A well-applied surgical dressing with plenty of cotton-wool is an effective bacterial barrier so long as the wound is completely covered and the wool remains dry. But if the whole dressing becomes soaked with serous fluid (as many do during the first two or three days in the case of burns) it is virtually transformed into a semi-solid mass of culture medium, and pathogens conveyed to the outer bandages either from contact with bedding or from the air will readily "grow through" it and infect the underlying wound. Laboratory tests (which will be reported elsewhere) have given unmistakable evidence that this can happen within a few hours, and clinical observation leaves little doubt that it has happened in some of our patients. A similar observation has been made independently and published by Neil Owens<sup>20</sup> in America. A sheet of 'Cellophane' incorporated in the dressing serves as an effective bacterial barrier to prevent such a happening, but if it completely seals off the burn the latter is apt to become sodden and does not heal quickly. A better barrier is being sought.

The endemic spread of these infections during recent months has undoubtedly been favoured by the persistence of the organisms in many of the wounds. In spite of attempts to eliminate them by the local application of various substances reputed to be efficacious—e.g., acetic acid, 'Phenoxetol,' silver nitrate, 'Katiodin' (diphenyl iodonium chloride), 2-amino-phenol, grana-acidin, and sulphacetamide—we have failed to do so with any regularity. Streptomycin has also been applied in the form of a cream (3-5 mg. per g.) to 10 cases, but the results have not been very encouraging. Pyocyanea readily acquires a high degree of resistance to this chemotherapeutic agent (sometimes within 48 hours).<sup>12, 24</sup> If it was not eliminated from the burn by the first or second treatments, further applications seemed to have little effect. We have therefore been unable to maintain a low reservoir of potential infectors as in the case of haemolytic streptococcus.

Other factors which have favoured endemic spread have been the employment (from necessity) of untrained help in the wards; the impossibility of temporarily closing the wards for washing down and fumigating; the absence of cubicles inaccessible to air currents from the pyocyanea-contaminated wards; and inadequate ventilation of such cubicles as have been available.

Happily not much harm has been done by the infection in these recent endemic cases. Several of the patients have run a mild febrile course during the first few days of the infection, but apart from this there have been few local or general ill effects. No patient has caused us anxiety. The successful grafting of the infected

areas has been little, if at all, affected by the presence of the organism; and the final functional results have been good. In several instances epithelisation of the wounds has been completed while pyocyanea was still present.

Such a benign course is not always associated with pyocyanea infection. In at least 3 of our earlier cases (whose infection was probably due to different strains from the recent endemic ones) the effects were very severe: 2 of these were serious burns of the hands—one by phosphorus and the other electric—and the third a superficial thermal burn of the forearm which developed the most intense acute dermatitis, from which only pyocyanea could be cultivated. The ultimate functional result of the burned hands was undoubtedly rendered very much worse by the infection than it would have been without it. These experiences have brought home to us the urgent need for a chemotherapeutic agent which will eliminate pyocyanea infection from burns as rapidly as penicillin does in the case of hæmolytic streptococcus.

#### Infection by *B. proteus*

Only 6 patients (0.8%) had this organism on their burns on admission, and none of these were fresh burns; but 89 patients acquired it during their stay in hospital (12%). This type of infection was particularly frequent in burns of the buttocks (about a third of all such cases) which could not be adequately covered by dressings.

It has proved difficult to prevent this organism from spreading in the wards, but its spreading seems to have done very little harm. All attempts to eliminate *B. proteus* by local applications have failed, but the organism usually disappeared as the burns healed. Its dissemination is probably by contact and aerial transfer. We have only once encountered it in a throat swab and only once in a swab from the nose. On one occasion we cultivated this organism from the hair of the scalp of a normal person.

#### Infection by *Staph. aureus*

Staphylococcus has been the most frequent invader of the burns, and we have been unsuccessful up till now in keeping it out. A routine survey 1946-47 showed that only about 3% of patients had this organism on the freshly burned areas on admission, and many of the superficial burns which healed within ten days did not acquire it, but in the more severe cases 60-70% of the patients acquired it at some period of their stay in hospital. The source of all these added infections is not clear. The organism was present on the skin remote from the burn (on admission) in only about 5% of the cases, but about 20% had it in their noses. During their stay in the burns ward the percentage of nose carriers increased to about 75 and that of skin carriers to about 50 (investigation by Dr. Elizabeth Topley).

The presence of staphylococcus on the burns in the early stages was associated with very slight suppuration and inflammation, accompanied by little or no fever. In a few cases (but not usually) the presence of staphylococcus on a burn interfered with the successful "take" of skin grafts.

Two other pathological manifestations of this type of infection have come to our notice from time to time. One of these was the occasional development of a transient erythematous rash almost exactly like that of scarlet fever. This happened in children who had no hæmolytic streptococci in their throats or on their wounds. The other occasional manifestation was a profuse suppuration of the burned surface, associated with little or no cellulitis. These patients usually seemed ill but had not much fever. Their dressings were extremely painful. Infection of this clinical type did not spread to other patients.

During the early part of this investigation, when a cream containing penicillin 200 units per g. and sulphathiazole 5 per cent was applied to all cases

at the plenary dressing and often subsequently, the great majority of the staphylococci isolated from the burns were resistant both to penicillin and sulphathiazole. Whether this predominance of resistant strains was due to rapid acclimatisation of many of them, or to multiplication and dissemination of a few resistant strains in the ward, we cannot say. (It has been impossible to phage type the strains hitherto). During 1947, when the cream used for local treatment contained only penicillin, the proportion of resistant strains dropped by 50%, and half of the resistant strains were insensitive only to penicillin.

#### Infection by $\beta$ -Hæmolytic Streptococci other than Group A; and by $\alpha$ - and $\gamma$ -Streptococci

All these types have occurred infrequently in this series of burns (less than 2% of all the swabs taken at all stages of recovery). In a group of 170 patients during the first half of 1947, 5 yielded a culture of  $\beta$ -hæmolytic streptococcus other than group A on more than one occasion (on two occasions group G; on four group C). There were also 3 cases with enterococci, 11 with *Streptococcus viridans*, and 10 with  $\gamma$ -streptococci.

One patient with a 73% burn died after three months with endocarditis due to *Strep. viridans*, which was recovered from her spleen post mortem. This was the only 1 of the 734 cases in which there was clear evidence that infection had played a major part in the fatal result.

*Infection by B. tetani*.—This has not occurred in any case. No antitetanic serum has been given.

#### SOURCE OF PATHOGENS ISOLATED IN BIRMINGHAM SERIES OF BURNS

The great majority of the burns which became infected at some period of their stay in hospital had no pathogens on their wounds on admission. (If we exclude the cases admitted one or more days after the accident, the number is almost 100%). We therefore have to admit that most of the infections were acquired in hospital.

The circumstances in which each of these hospital infections (by hæmolytic streptococcus, *Ps. pyocyanea*, and *B. proteus*) took place were investigated at the time of their occurrence (see discussion by Bourdillon and Colebrook,<sup>4</sup> Colebrook et al.<sup>7</sup>). This routine investigation has made it clear that at least 90% of the infections were due to transmission of a pathogen, not at the time of dressing in the dressing-station but between one dressing and the next—i.e., the transmission took place in the wards. And it was clearly associated in the great majority of cases with imperfect coverage of the wound.

It has been much more difficult to determine how many of the infections were autogenous and how many exogenous in origin—i.e., how many were derived from the patient's own skin or respiratory or intestinal tracts, or from his blood-stream, and how many from some outside source. In a few cases the serological identity of streptococcal types has made it clear that the burns have become infected with streptococci derived from the respiratory tract of the patient himself; in a few more they have evidently been transmitted from small lesions of some part of the patient's skin remote from the burn (such lesions should always be systematically looked for and vigorously treated); in some other cases infections of the burned buttocks and thighs were possibly derived from faecal contamination, though we have found no evidence of such an origin.

There remain many cases—the majority—in which there is no reason to suspect such an autogenous origin, and our experience leads us to believe that transmission of pathogens to most of these must have been by indirect contact from another infected case, or by airborne particles. Evidence of such aerial dissemination of

hæmolytic streptococci in the dressing-station and the wards at one period has been reported (Colebrook and Ross<sup>5</sup>):

SURVEY OF INFECTIONS REPORTED IN CONNEXION  
WITH BURNS

Though it has been generally recognised for many years that septic infection is the most serious complication in recovery from burns, there has been remarkably little investigation of this process. In the many reports of burns we have found only three or four papers which give any bacteriological data. (Our search of the German published reports has not been exhaustive.) The earliest reference we have found is that of Pack (1926),<sup>21</sup> who states:

"Practically every burn is infected within a few hours, but the infection is not necessarily clinically manifest until the necrotic tissue begins to slough away. The infection is always mixed, the organisms usually being *Strep. pyogenes*, *Staph. aureus*, *Ps. pyocyanea*, and the *B. fetidus*, *B. subtilis*, *B. proteus*, and other saprophytes are occasionally found."

Aldrich<sup>1</sup> (who gives credit to his colleague Firor) summarises their observations at the Johns Hopkins and Boston City Hospitals in 1933 as follows, but unfortunately gives no figures:

"For the first 12 hours these areas were practically sterile, a few contaminations such as *Staph. aureus* and *albus*, and *Bact. coli* were frequently found, but the growth was slight. After the first 12-hour period it was found in a 100% of the severely burned patients, and in a large majority of the minor burns there could be grown from repeated cultures the  $\beta$ -hæmolytic streptococcus or the  $\gamma$ -streptococcus. The concentration of these organisms increased with the obvious signs of sepsis and the beginning of the toxicity of the patient, until after 48-56 hours pure cultures of the streptococci could be obtained, having outgrown all other organisms. Coincidentally, the characteristic effects of the burn were shown by the patient."

He also stated that blood-cultures, after the temperature had started to swing in the "picket-fence curve," were positive for the invading streptococci. In fatal cases this organism was found in the heart blood and in the lungs when there had been terminal pneumonia.

The only data we have found in the published reports showing the incidence of streptococcal infections are those of the burns wards of the Glasgow Royal Infirmary. In that hospital for many years burns have been segregated in two large wards, male and female. The patients are dressed in these wards. Investigation by Cruickshank<sup>2</sup> in 1935 showed that 66% of 32 cases in the burns wards had hæmolytic streptococci in their wounds 3-6 days after admission, as compared with 11% in 100 cases at the time of admission. In the same wards in 1941 Dr. R. D. Stuart<sup>26</sup> found that 83% of the 26 cases he investigated acquired hæmolytic streptococci on the burned areas within a few days after admission. (Subsequent experience in these wards made it clear that, if he had followed them throughout their stay in hospital, the figure would have been nearer 90%.) Colebrook et al.,<sup>6</sup> working in these same wards during 1942-43, found that, by revision of the dressing technique and the local application of sulphonamides (and in some cases penicillin), it was possible to reduce the figure for "added infections" to about 30%. Langohr and his colleagues<sup>18</sup> in Boston (1947), who were able to treat their patients in single rooms and to do all dressings in the operating-theatre under aseptic precautions, have apparently obtained better results. They do not state the actual incidence of streptococcal infections occurring at any time during the stay in hospital, but their records make it clear that nearly 10% of all swabs taken from the burns between the 21st and 28th day grew  $\beta$ -hæmolytic strains. Most of their cases were treated with systemic penicillin prophylactically, often for as long as 49 days.

DISCUSSION

The foregoing data deal with a study of burns from the bacteriological angle. The Birmingham experiment of the last three years has made it clear that the great majority of these injuries can be kept free from any infection that is clinically significant if we provide the right conditions. Such provision, however, will involve considerable effort and expense. The questions, therefore, arise: how much does infection really matter? and, is all this effort and expense justified?

To answer these questions effectively it would be desirable to present objective data derived from a study of comparable groups of severe burns, infected and uninfected, showing the case-mortality, the stay in hospital, total periods of incapacity, and ultimate recovery of function, along with indications of impairment of health during the recovery period—e.g., temperature and weight curves, hæmoglobin and plasma-protein levels, nitrogen balances, &c. Such data will probably never become available, because it seems unlikely that any such investigation was ever carried out on any large series of infected burns before the days of penicillin and the sulphonamides, or is being carried out today on any similar series. But the comparison is hardly necessary. The clinical picture of the infected severe burn is all too familiar to most surgeons. They will readily recall the red inflamed burn with swollen edges and perhaps exposed tendons, and joints exuding pus; the patient in pain most of the time, and the pain greatly accentuated at every dressing; his swinging or sustained fever, loss of appetite, rapid wasting, and progressive anæmia; and his morale becoming undermined, healing slow, and attempts to graft his burns often unsuccessful. If healing was finally achieved after many weeks or months, the contractures which developed limited function and had still to be dealt with by a plastic surgeon, or perhaps endured throughout life. Though penicillin and the sulphonamides have improved the picture to some extent, it remains substantially true for most severe burns.

Against this background of human misery the clinical course of the severely burned patient who does not become infected presents a striking contrast. From the time his burns are first dressed—with a cooling cream or soft-paraffin gauze—he is usually comfortable; and when the dressings are changed, after 10-14 days, the process causes him little or no pain because the tissues are not inflamed. Sloughs will be separating aseptically at that time. (Bacteria are not necessary for this purpose, as has been suggested, though their presence may sometimes hasten the process.) Whenever the surgeon judges it most opportune, any remaining sloughs can be removed surgically and skin grafting carried out with good assurance of success, approximating to 100%. If the whole area cannot be grafted at a single operation, a second grafting can and should be carried out a few days later. Meanwhile the patient's general condition remains good. Apart from some febrile "reaction of injury" during the first 48 hours, he has had no fever, his appetite has been good, he has slept well, and anæmia has either not developed at all or is much less severe than in the infected patient. Blood-transfusions have seldom been required. If a child, he will have been playing with his toys from the second or third day.

There is no doubt that so great a change in the clinical course is reflected in the mortality and the period of incapacity. In 1927 Fraser<sup>13</sup> reported a case-mortality of 30% for 300 burned children under 12 years of age in Scotland; and an even higher figure was given by Robertson and Boyd<sup>23</sup> for 100 burned children in Toronto (1923). The case-mortality dropped considerably between 1930 and 1940, but was still 10.3% for burns of children and 3.7% for scalds in the latest series.

reported from Edinburgh by Wilkinson<sup>27</sup> for 1938-42. At the Birmingham Accident Hospital in 1946-47 the comparable death-rate for 241 children has been 1.7%. Better treatment for shock was no doubt the reason for a considerable part of that saving of life, and the elimination of septic infection for most of the rest.

There are no reliable data for comparison of the stay in hospital and the total period of incapacity for large series of infected and uninfected burns of similar severity, but there can be no question that such a comparison would show a great disparity. On this ground alone it should be easy to justify the effort and expense required to eliminate infection. It is estimated that there are nearly 25,000 burned people admitted to hospital beds each year in England and Wales. On the assumption that, if they become infected, they occupy these beds for 10 days longer than if they remain uninfected (this is probably a considerable underestimate), that would mean a saving of 250,000 hospital bed-days each year. The saving of total days lost to industry, housekeeping, and schooling would be at least four times greater, since this figure would take into account also the burns not admitted to hospital, a large number of which become infected and heal slowly.

All these considerations—the saving of life and pain, the recovery of full function, the reduction of invalidism and incapacity, and the economy of man-power and hospital facilities—add up to the conclusion that *the avoidance of infection in burned people is the central problem after the management of the shock period.*

If that conclusion is valid, it means a complete reorientation of our thought and teaching about burns. We must no longer accept septic infection of the deep burn as an inevitable, almost normal, phase of recovery, but must definitely take as our target the complete elimination of septic infection, just as we do for operative surgery. Such a programme requires a fourfold attack.†

#### (1) *At Time of Dressing*

No pathogens must be allowed to reach the wound at the time of dressing. That means we must prevent their transmission not only from the respiratory tract (of the dressing team and the patient himself) and from hands, instruments, dressings, &c., but also from the air of the room in which the dressing is carried out. The plan adopted at Birmingham (see above and Bourdillon and Colebrook<sup>4</sup>) of carrying out all dressings in a special room ventilated by an abundant stream of filtered air has proved so strikingly successful that its use elsewhere is now fully justified both for dressing-stations and for operating-theatres. Apart from the rapid removal of pathogens from the air, it provides a comfortable atmosphere for the staff, since both temperature and humidity are under control, and the air is continuously in motion; and it quickly eliminates unpleasant odours. Its disadvantages are that it is wasteful of heat and somewhat noisy owing to turbulence in the ducts, but this last difficulty can probably be overcome, in part at least. Where economy is essential the cost of installation can be reduced by substituting hand controls of the heating and humidity for thermostatic control. Considerations of cost should, however, be balanced against the anticipated saving on patients' maintenance. The average reduction of ten days on the stay in hospital of 300 patients, each costing about 27s a day, would mean the saving of £5000—i.e., much more than the initial cost of the ventilation plant and running expenses for a year.

#### (2) *Between Dressings*

No pathogens must be allowed to reach the wounds between one dressing and the next. This is a matter

† This paper has reference only to the patient's treatment in hospital. The appropriate precautions against infection are also required, of course, before he reaches hospital (M.R.C. Special Report, no. 249).

of much greater difficulty, and probably will always be so, for burned people are more infectable, and more infective, than almost any other class of patients. In theory it appears a simple matter to protect the burn with a dressing which offers an effective barrier to bacterial invasion. In practice it is far from simple. Efficient bandaging of some parts of the body requires considerable skill, and complete coverage is clearly out of the question for burns involving most of the face, the buttocks, and the perineum. For many others the coverage of the wound may be perfectly adequate when the patient leaves the dressing-room, but it will not remain so when the limb shrinks with absorption of oedema fluid from the burned tissues, or when the child becomes impatient of lying quietly in bed, or when he interferes with his bandages. And, as described above, even an intact dressing will not afford effective protection when it is soaked with serum; pathogens can grow through it from the outside.

To counter all these manifold hazards in a ward full of burned patients will tax the resources of the best medical and nursing staff to the utmost; and the hazards will be multiplied a hundredfold if, under the urge to deal with more and more distressing accidents, the wards are allowed to be overcrowded. Human frailty, too, has to be reckoned with, for in the last resort it is the intelligent and conscientious day-to-day work of the doctors, nurses, and ward orderlies that will ensure success or failure in this struggle against invisible enemies.

Clearly, in these very difficult circumstances the organisation of a burns centre should be such as to give the fewest opportunities for the dissemination of pathogens. The large open ward we have been accustomed to will certainly not give this, even with ample spacing of beds and strict barrier nursing. The experience of fever hospitals in the last twenty years<sup>28, b 14</sup> has clearly shown that single-bedded cubicles, giving on to an open verandah and freely ventilated, afford the best safeguard against cross-infection; and provision of this kind will be necessary to secure and maintain the maximal freedom from infection in burns.

#### (3) *Elimination of Pathogens*

The reservoir of potentially infective patients in the wards must be kept as low as possible by the prompt elimination of pathogens from the wounds of those who do become infected. Hæmolytic streptococci can usually be eliminated from a burn within a few days (often only three or four) by the local application of penicillin—and often also by sulphonamides. This unexpected development in therapy has profoundly altered the whole outlook for the control of these infections. It means that the streptococcus-infected patient, instead of disseminating these organisms from his bandages, bedding, &c., for weeks or months, as he has usually done in the past, is a danger to other patients for only a few days, provided his bedding is changed as soon as his wounds are free of streptococci (Colebrook and Ross<sup>8</sup>). And for the infected patient himself the prompt elimination of streptococci means that his wounds can be successfully grafted at an early stage, thereby avoiding any risk of reinfection.

By virtue of this new power to control streptococcal infections, which have always been by far the most serious menace to the burned patient, these infections are now the easiest to control. If we knew how to eliminate *Ps. pyocyanea* and staphylococcal infections equally promptly and certainly, the management of a ward full of burned patients would become very much easier. We should be well within sight of the target—healing of all deep burns without infection. This elimination of pyocyanea and staphylococcus infections should be the next objective for those working on burns.

#### (4) *Reduction of Raw Surfaces*

The number of raw surfaces at risk must be reduced as much as possible by early and, if necessary, repeated skin grafting. However much we improve the set-up for burned patients—e.g., by nursing in cubicles, dressing in microbe-free air, and the prompt elimination of pathogens—it will never be easy to keep the large raw area free from infection throughout a long period of recovery. The opportunities for such infection will always be numerous. The danger is only past when the raw area is covered with skin. Too often in the past a vicious circle was established: the wound did not heal, because it was infected; and it remained infected, because it did not heal.

Many deep burns, if circumscribed and of limited extent, can be excised and grafted on the day of the accident with great advantage to the patients, but the choice of suitable cases for such treatment calls for knowledge and experience on the part of the surgeon. Many other cases can be grafted within the first two weeks, after excision of any remaining sloughs. In other cases, where the deep burning is extensive or patchy, or where there is doubt about the chance of rapid spontaneous regeneration of epithelium, it will be expedient to wait for two or three weeks.

Grafting (except when this is done on the day of the accident) should never be undertaken without first ascertaining that the wound is free from hæmolytic streptococcus (group A); and, if that organism is found, the operation should always be postponed until it has been eliminated with penicillin.

#### *Administrative Arrangements*

There remains for discussion the problem of the influence of administrative arrangements on the control of infection in burned patients. At present very few hospitals make special provision for these injuries; they are regarded as ordinary surgical casualties and as such are admitted either to the general wards or, in some cases, to the "septic block." Treatment is left, for the most part, to an inexperienced house-surgeon and is seldom guided by bacteriological findings: dressings are done in the wards or occasionally in a room set apart for dressings but without any provision for securing the sterility of the air; skin grafting is often not done or is postponed until all sloughs have separated (4–6 weeks), when the optimal conditions for a successful "take" no longer exist.

Such arrangements do not offer the burned patients the best, or even a good, chance of recovery without infection, or recovery with full function.

If we regard the control of infection as the chief aim of treatment (the treatment of shock is not here under consideration), there seems to be a choice of three administrative plans:

(1) We can admit burns to all hospitals, distribute them to several wards as heretofore, and dress them in a room reserved for that purpose but not provided with special equipment to ensure continuous purification of the air. The distribution of the cases in several wards will probably offer fewer opportunities for cross-infection than does a ward full of burns, but past experience shows that most of the deep burns will become infected nevertheless. The dressing-room without special ventilation, if used for a series of dressings, might well favour, rather than avoid, cross-infections. If circumstances compel its use for the time being, the room should be freely ventilated by opening windows between the dressings.

(2) We can admit burns to all hospitals as above but provide a specially ventilated room for their dressings. This should be decidedly better than plan (1); but, since most hospitals would admit only a small number of severe burns, and surgeons are very busy people, treatment would usually have to be delegated for the most part to junior surgical officers with no special training in the procedures necessary for the control of infection (nor in the treatment of shock).

(3) In each large city we can segregate burns in one or two hospitals, where special wards would be set aside for them and where dressing-rooms would be available, specially equipped and provided with clean air. In such special centres the patients would be entirely in the hands of surgeons trained for the task, working in close collaboration with an applied bacteriologist. Under this plan a considerable measure of success in the control of infection should be obtainable, but it will not be complete unless most of the cases can be nursed at least for the first 1–4 weeks in well-ventilated cubicles capable of fumigation. In our judgment this latter plan is long overdue. There are at present few young surgeons with the special training required for this work, but more could be trained in a few months.

#### SUMMARY

Most of the sepsis of burns is due to hospital infection and can be prevented if the right conditions and the appropriate routine are established. The complete elimination of such infection should be the target in all treatment of burns.

Two distinct objectives have to be kept in view: (1) blocking the transmission of pathogens to the burns at the time of the dressing; and (2) blocking their transmission to the burns between one dressing and the next while the burns are (in theory) adequately covered.

The first of these objectives has been successfully attained during the three-year period in the burns unit at the Birmingham Accident Hospital (734 cases treated) by carrying out all dressings by a trained team using a strict aseptic technique, in a room ventilated by an abundant stream of filtered air. The number of patients infected by hæmolytic streptococcus and pyococcyana at the time of dressing under these conditions has been less than 1%.

The second objective has proved much more difficult, and the success achieved has been less complete. The great majority of the infections transmitted in the wards between one dressing and the next occurred in patients whose burns were difficult (or impossible) to cover adequately with dressings—e.g., burns of the buttocks and perineum or the face—or in patients who interfered with their dressings, conveying pathogens directly to the wounds or allowing contaminated dust particles to reach them. When dressings become soaked with serous exudate during the first few days after burning, pathogens conveyed to the outer bandages from the air or from bedding are able to "grow through" the dressing and so infect the burned surfaces. The use of cellophane as a bacterial barrier to prevent this is suggested.

Streptococcal infections have proved the easiest to control, because they can be quickly eliminated from the burns by local application of penicillin (or of sulphonamides), thus reducing the reservoir of potentially infective cases to a low level. Infection by pyococcyana and staphylococcus, which could not be eliminated so quickly or so certainly from the wounds, were much more difficult to control.

In view of the manifold opportunities for cross-infections presented by a large ward full of burned patients, and the highly infectable nature of the wounds, it is concluded that the best way to maintain a high level of freedom from hospital infection would be to nurse all burns during the first few weeks in single-bedded well-ventilated cubicles, each of which could be readily fumigated after it had housed any infected case. Strict barrier nursing of infected cases would also be necessary.

The provision of such special accommodation, as well as the requisite surgical and nursing experience to deal with these difficult cases, presupposes the segregation of burns into one or two centres in all our large cities. The system adopted heretofore of admitting them into the general wards of all hospitals cannot be regarded as satisfactory. Even more unsatisfactory is it that at



the present time there is only one hospital in the British Isles (so far as we are aware) where provision exists for dressing burns in a dust-free and microbe-free atmosphere.

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## SUPERNUMERARY NIPPLES AND NEUROSIS

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ANTHROPOLOGISTS for many years have sensed the possibility of some relationship between human behaviour and certain physical characters. From time to time enthusiastic workers have striven to produce a scientific classification to explain the coexistence of stigmata and abnormal behaviour, either social or antisocial.

Among these Lombroso is probably the most famous, his monographs *The Female Criminal* and *The Man of Genius* being classics in their sphere. In England Lombroso's work was pursued by Havelock Ellis (1910), but always the subject proved too elusive to be brought within a scientific system. These workers, however, have shown human behaviour to be a resultant of many forces, some of which are but imperfectly understood; and of these latter only a few are accessible to scientific investigation.

Ellis reminds us that with regard to antisocial behaviour one must bear in mind the influence of three groups of phenomena: cosmic, social, and biological. Climate is an example of the first; scarcity of the second; and personal peculiarities of the third and most readily accessible group. In the present investigation I deal exclusively with biological influences. I tried to find whether it could be shown that a certain skin vestige coexisted in a series of cases with a pattern of

neurotic behaviour to a greater degree than chance could explain. In this paper the supernumerary nipple is presented as an example of a skin vestige reflecting the early mammalian history of man.

It will be of interest very briefly to draw attention to other vestiges found in the human skin as reminders of a much earlier relationship.

**Multiple Pigmented Moles.**—Laidlaw and Murray (1933) have shown that pigmented moles (fig. 1) in man are vestiges of reptilian tactile organs. The histology (fig. 2) suggested that formerly the pigmented mole had a full complement of sensory nerves and tactile terminals. Normal tactile organs may be seen on the jaws of alligators (fig. 3). In the human skin they may be associated with the so-called plane pigmented patches or nævus spilus.



Fig. 1.—Multiple pigmented moles (over 40 were counted) in strongly allergic subject.

**Vascular Nævi.**—The phylogenetic hypothesis may be extended to include vascular nævi (fig. 4), which Laidlaw

and Murray (1933) suggest should be interpreted as vestiges of a respiratory plexus inherited from that far-off ancestor the primitive amphibian that breathed through its skin. The salamanders living today have preserved this primitive type of respiration, bearing in their skins a rich capillary plexus that serves as a lung.

These three vestiges represent three separate and widely distant eras in the human evolutionary journey, and serve to recall the words of Maurer (quoted by Laidlaw and Murray 1933):

“A man is not merely the child of his parents, he is rather the end-point of an immeasurable line of ancestors whose witness are the single steps of his embryonic evolution and the many vestiges in his finished form. Such testimony shows that the genes of the impregnated ovum contain the hereditary factors of many different types of animals.”

This view is well illustrated by fig. 5.

The present task is to determine the clinical importance of the identification of such structures in health and

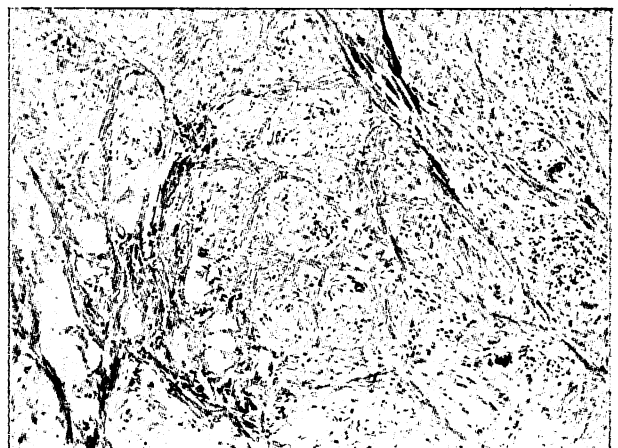


Fig. 2.—Histology of pigmented mole showing resemblance to tactile corpuscles (Laidlaw and Murray 1933).

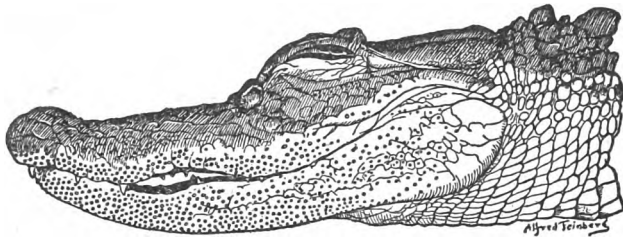


Fig. 3—Alligator's tactile organs (Laidlaw and Murray 1933).

disease, and to interest others better placed and more experienced than myself in a problem that is more important than may appear at first sight.

HISTORICAL

The mythology, as it may be called, of the supernumerary nipple, is worthy of examination.

An Asiatic figure of Artemis of Ephesus (fig. 6), now at Naples, depicts her with considerable polymastia, sixteen well-formed breasts being visible in the statue. A woodcut showing a functional breast on the outside of the thigh, with a small child standing to suckle this unusually placed organ, is also on record (fig. 7). Julia, the mother of the Emperor Alexander Severus, received the soubriquet Mammæa because she had supernumerary breasts. Anne Boleyn, the unfortunate wife of Henry VIII, was reputed to have six toes, six fingers, and three breasts. Linnaeus says that in his time there existed a Roman woman with four mammae, very beautiful in contour, arranged in two lines, regularly, one above the other, all of which gave milk in abundance. Those who visit the Louvre in Paris may see a picture painted by Rubens of a woman with four breasts.

These are but a few of the remarkable and possibly inaccurate records of polymastia which startle rather than enlighten the inquirer.

However, Lichtenstern (1878), of Tübingen, dealt exhaustively with the subject and literature of polymastia and of the accessory or supernumerary nipple. It was with this work available that Bruce (1879) wrote his account of three years' observation of patients from the point of view of detecting the occurrence, position, and the nature of the supernumerary nipple. He acknowledged his debt to Lichtenstern but, unlike him, did not draw any conclusions. Lichtenstern stated emphatically that in his opinion the accessory nipple was an atavism, but on this point considerable hesitation



Fig. 4—Vascular naevus.

has been shown by many other investigators. Obviously, breasts and accessory nipples that do not occur along the embryonic milk-line are less certainly due to atavism.

It is interesting to follow the approach made to this problem by Darwin (1888). Preyer (1869) had described an erratic mamma occurring on the back and another on the thigh, and Darwin realised that this greatly weakened the case for regarding all additional mammae as being due to reversion. Nevertheless his final pronouncement was that probably in many cases this abnormality was atavistic.

Hamblen (1945) says that polymastia is regarded today as an atavism, and that such structures, including supernumerary nipples, may be located anywhere in the milk-line of the embryo and are present in roughly 1% of the population.

de Cholnoky (1939) describes clearly the embryology of the milk-lines with diagrams of their position in the adult (fig. 8) and of other sites in which supernumerary breasts have been found (fig. 9). He also describes the comparative anatomy of these structures in the following terms:

"It was Geoffroy-Saint-Hilaire who, in 1836, suggested that man was descended from animals having multiple breasts. Darwin later subscribed to this theory. In his 'Descent of Man' in 1871 he called attention to the fact that supernumerary breasts should be considered an atavistic manifestation.

"Phylogenetically, inguinal breasts are found in the pouched mammals (monotremes and marsupials) as well as in the ungulates and cetaceans. In elephants, sirenias, bats of some types, and most of the primates breasts are confined to the pectoral region, as is also the case in some rodents—e.g., the jumping hare (*Pedetes caffer*). Axillary breasts develop normally in the fruit bats and the flying lemurs. Mammæ are found in the inguinal region in one of the lemurs of Madagascar, in the acromial region of the gentle lemur (*Hapalemur*), and

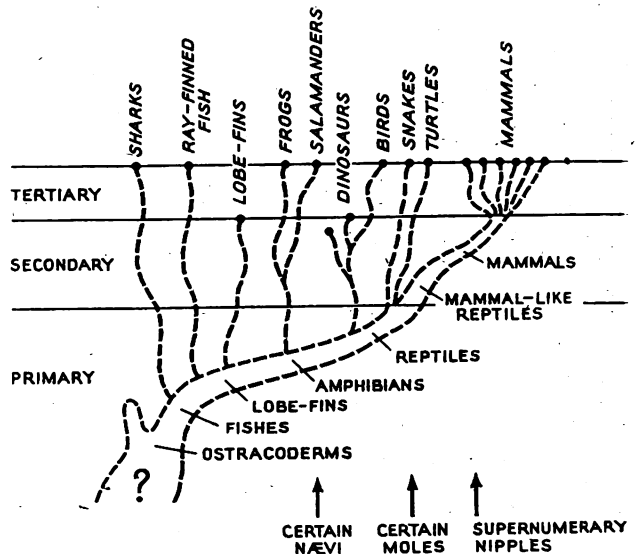


Fig. 5—Theoretical phylogenetic origin of certain skin vestiges. The phylogenetic tree is that of Howells (1944). It should be borne in mind that there is no suggestion of relation between the alligator's tactile organs (fig. 3) and the multiple pigmented moles (fig. 1); but a common origin seems an inescapable deduction from histology.

behind the axilla in the hutia (*Capromys pilorides*). The porcupine has a mammary gland on the anterior side of each axilla; in the nutria (*Myocastor*) the mammae are placed behind the scapula, while in the cetacea (whale, porpoise, dolphin) they are placed on the labia of the vulva. The viscaccia (*Lagostomus maximus*) and some other rodents have breasts on the dorsolateral aspect of each thigh. In the opossum there is commonly a breast in the midline of the abdomen and thorax, in addition to numerous other mammae.

"According to Hartman, the largest number of breasts found in animals is in the South American marsupial (*Monodelphis henseli*), which has twenty-five, and in the insectivore tenrec of Madagascar (*Centetes ecaudatus*), which has twenty-two pairs. The latter is probably the most prolific of insectivores, as many as twenty young being brought forth at one birth. Among the primates, not only human beings but anthropoid apes (though perhaps less frequently) have supernumerary breasts. Aside from reports of a few unilateral nipples (reported by Hartman), Coolidge first recorded a case of symmetric supernumerary mammae in a chimpanzee."

de Cholnoky deals with the different racial and sex-incidence and points out that there is evidence that even those supernumerary nipples occurring out of the milk-lines may be atavistic in their origin. He believes the usual ratio of occurrence in all situations is 1-2% of the population.

ANATOMICAL

In the present investigation I decided to include only cases where the structure, which it is suggested is a super-

numary nipple, occurred in the embryonic milk-line. The supernumerary nipple provides an easy and usually unequivocal clinical entity which is accessible to routine clinical examination.

In his classical paper on the supernumerary nipple, written in 1879, Bruce emphasised the great range of variations that might occur both in men and women; some examples, in every particular except size, resembling an ordinary male mammilla, while others require considerable experience for their discovery and identification. The best-marked cases present the central papilla or nipple proper, a pigmented areola, follicles, hairs, and a distinct depression on the apex of the papilla. Examples of such a fully developed supernumerary nipple (fig. 10) are rare. The more usual condition is that one or more of the parts of the fully developed mammilla just enumerated may be either ill marked or wanting.



Fig. 6—Artemis of Ephesus.

**Papilla.**—The papilla may vary from a perfect formation (fig. 11) to complete absence, may vary greatly in size, and may be erectile, like the ordinary nipple, even when the papilla is extremely minute, thus confirming its identity. In a considerable number of the less pronounced examples of supernumerary nipples no opening is seen in the papilla, but occasionally a simple apical depression is visible.

**Areola.**—The areola may be of any dimensions from a well-formed area (fig. 12), somewhat smaller than the areola of the ordinary mammilla, to the smallest

possible line of pigment round the base of the papilla. In other cases it is entirely absent. No certain relation exists between the size of the areola and the size of the papilla. The outline of the areola often lacks the regularity of that of the ordinary mammilla and, instead of approaching the form of a circle, it is often rather oval, transversely, with a slight inclination of the long axis downwards and outwards. The colour of the areola varies much, like the other elements. It is often pigmented; in other cases it is a delicate pink, and sometimes it cannot be distinguished from the colour of the skin around. In the last case the areola can be recognised only by the presence of a depression, similar to the depressed condition of the ordinary mammilla in some young male subjects, in the centre of which stands the papilla. Bruce describes other cases in which the areola appears to be represented by a depression in the skin or by a simple pigment spot on the embryonic milk-line.

**Follicles.**—The follicles that are found upon the surface of the areola of the ordinary mamma, especially along its border, are rarely distinct as such in the supernumerary nipple.

**Hairs.**—These may be met with in some cases growing strong and black from the margin of the areola. They are in the great majority of cases entirely absent. Bruce sums up as follows:

“The papilla, areola, follicles, and hairs which represent the various elements of the supernumerary nipple will, it is found, vary very considerably, as in a number of cases the abnormality is imperfect, either the papilla, or the areola, or the hairs and their follicles being alone present of them, or various combinations of these or perhaps the same in association with certain elements of the ordinary skin.”

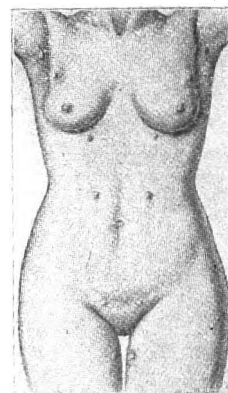


Fig. 8—Position of embryological milk-lines in the adult (de Cholnoky 1939).

In the present series, the structures listed as supernumerary nipples vary from fully developed structures to the merest token which can be identified only by its histological structure. However, where doubt existed about the nature of such a structure, the case was discarded. Only structures occurring on the milk-line were regarded as possible supernumerary nipples, and during the search for these cases there was little temptation to diagnose as a nipple or a breast any structure that did not fall within this line.

CLINICAL FINDINGS

**Case 1.**—A patient known to me for sixteen years as a man of profoundly neurotic personality was found to have a well-marked accessory nipple (fig. 10), a fact which passed for many years without attracting undue attention.

**Case 2.**—A woman of good social position, who had been observed for sixteen years for illnesses with a considerable neurotic superstructure, was also found to have a well-developed accessory nipple.

A search was then made for these structures, and all cases that were discovered in the course of practice were noted and the personality of the patient was assessed. In many cases long association with the patients enabled a very complete insight into their personality to be obtained. Other patients seen either in the outpatient department or in general practice were less well known and it was less possible to speak with authority on their personality: in these cases the family doctor was consulted whenever possible.

A doctor living in a small community with his patients finds that there are some people who impress him as



Fig. 7.—Functional supernumerary breast on left thigh, from an old woodcut by an unknown artist (Gould and Pyle 1897).

having a neurotic personality. Sometimes this will appear almost on first contact with them. They open his consulting-room door, or he goes to their bedside, and he is aware that, whatever organic lesion he may find, the patient is neurotic. The greater his experience the less often is he wrong in his first impressions of these unfortunate people. It is therefore not a waste of a doctor's time, even on a brief acquaintance with his patient, to attempt to assess whether there is a pattern of behaviour more neurotic than is inevitable in all illness. Inquiry and conversation will often show the degree to which this is the person's usual reaction to illness and difficulties. Our grandfathers would have said that some patients had a neurotic diathesis or constitutional predisposition to neurosis; and, as this investigation proceeded, it became apparent that the law of probability would not explain the frequent occurrence of a neurotic ingredient greater than normal in persons with a supernumerary nipple on the embryonic milk-line.

Great care has here been taken to avoid error in the use of the words "unstable" and "neurotic." It is clearly realised that most patients can be described in

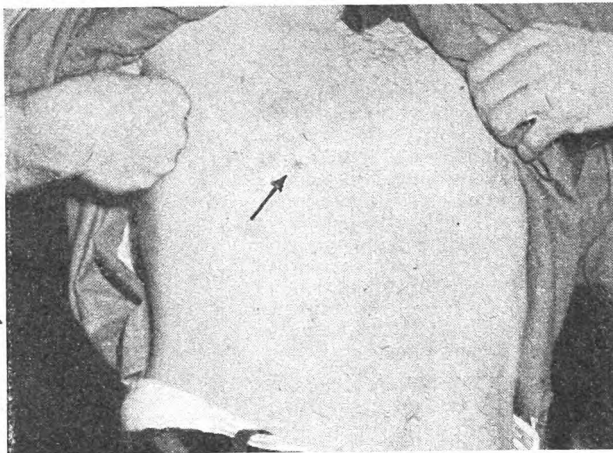


Fig. 10—Supernumerary nipple with papilla, on embryonic milk-line below right breast in a married man (case 1), aged 50, known to the author as his family doctor for 16 years. Patient is highly unstable and has often reported with trivial complaints overshadowed by a neurotic superstructure. A highly neurotic man by any standards, his life is dominated by his "nerves," as his family realises only too clearly.

such terms if loosely applied. These terms are used here to denote a degree of emotional lability that is considerably in excess of what a medical practitioner regards as normal. Many of the patients come from a large group practice, where they and their families are well known to several doctors.

I have made no selection but have included in my analysis every case known to me of a supernumerary nipple on the embryonic milk-line. Having at length collected 100 cases\* in this way, I have analysed the series as follows:

	No. of cases
Group A: patients who are beyond reasonable doubt unstable, an opinion often confirmed by one or more independent doctors .. .. .	65
Group B: patients in whom the probability that they are unstable is strong .. .. .	23
Group C: patients in whom there might be a doubt, and the patient is in every case given the benefit of any possible doubt .. .. .	12
Total ..	100

\* The case-records can be inspected at the library at the Royal Society of Medicine, and copies of them can be obtained from THE LANCET Office.

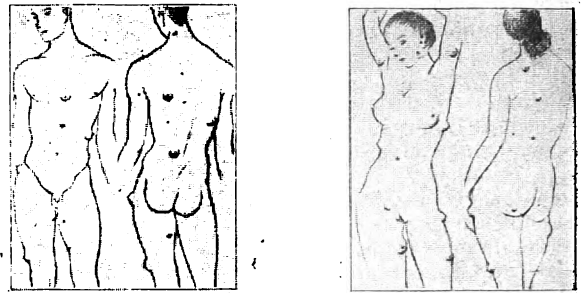


Fig. 9—Sites of supernumerary breasts found outside the milk-lines (de Cholnoky 1939).

The value of a control series of cases of consecutive patients not showing a supernumerary nipple in the milk-line has been considered, and in view of the high proportion of cases in groups A and B has been regarded as serving no useful purpose.

DISCUSSION

Consideration of these cases will perhaps stimulate other workers to disprove or modify the following suggestions.

Prof. Wood Jones (1939) has said:

"In its development and, indeed, throughout life, the central nervous system has two divisions. There is the concealed portion, the brain, the spinal cord and the nervous system; but there is also a visible portion: the skin with its sense organs."

Both systems originate from the same cell, and both may share the risk of atavism where it is exhibited by one, because of this common origin from the cell of the primitive ectoderm. Should the skin exhibit undisputed atavism, may we not look a little closer at the concealed portion of the ectoderm for some guide that may assist us in appreciating any share it has in the exhibition of characters that man is tending to outgrow?

Hughlings Jackson has given us the term "anatomical substratum" as applied to personality. More recently Berry (1944) has shown how closely personality is bound up with the degree of development of the supragranular layer of the cerebral cortex, and says:

"The supragranular layer of the cortex, being the most recent, is naturally, as yet, in a state of flux. Hence, some

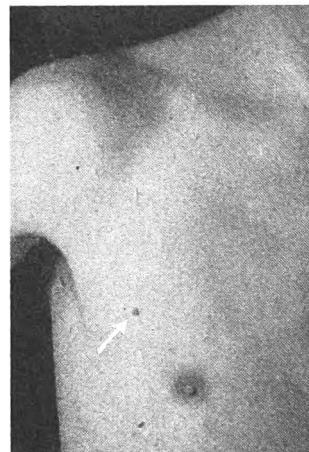


Fig. 11—Supernumerary nipple, with well-marked papilla, on milk-line above right breast in a man (case 60), aged 55, known for many years as neurasthenic. He has had many "nervous breakdowns" and seen many doctors, who are all agreed that he is unstable. He realises this himself, as his career has been spoilt by what he calls his "nerves."

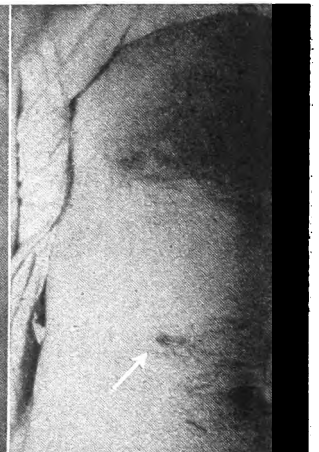


Fig. 12—Abdominal supernumerary nipple with well-marked areola in a man (case 61), aged 38, who has had migraine as long as he can remember, severe enough to stop him from working during the attacks. He was in hospital with pneumonia and appeared most unstable. There was a strong element of obsession in his case.

of the vagaries of the human behaviour in those in whom it is not yet sufficiently developed to give stable reactions to the environment of a complex civilisation."

May it not be that what passes as neurotic illness is often illness of obscure pathology in people with brain types a little less advanced than their more stable or so-called more normal fellow citizens? Were it possible to identify these people and to shelter them in industry and in life, their efficiency would be greatly enhanced with a corresponding increase in their value to the community.

The comment of Ellis (1901) on unstable students of Harvard University investigated by Stein (1898) still rings true after fifty years:

"They have the congenital constitution and predisposition on which some severe psychic lesion at the 'psychological moment' might develop the most definite and obstinate symptoms of hysteria, but under favourable circumstances they will be ordinary men and women, of no more than ordinary abnormality or ordinary power. They are among the many who have been called to hysteria at birth; they may never be among the few who are chosen."

Because the seeking for the springs of life is an art no less than the living of it, no final words are more apposite than Alexander Pope's descriptive summary of man—"At once the glory, jest, and riddle of the world."

#### SUMMARY

A hundred cases have been observed in which supernumerary nipples were noted on the embryonic milk-line.

Critical examination of this series of unselected cases reveals that supernumerary nipple is associated with a neurotic pattern of behaviour more often than would be expected by chance.

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## SUSCEPTIBILITY TO CHOLERA

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It is well known that, unlike smallpox and many other epidemic diseases, cholera does not strike all classes of people with the same severity. Instead, it selects a small number, usually from the lowest economic and social level, where poverty, dirt, malnutrition, overwork, and disease are rife.

The story has often been told me of four members of my family who in 1882 went to Mecca, where cholera was epidemic. Only one, the poorest and least healthy, succumbed, though he was nursed, had his clothes washed, was washed after death, and was buried by the rest of the group, who also remained there a month afterwards taking the same care of all the cholera patients they knew. Needless to say, they knew nothing about the elements of prevention or hygiene.

Clot Bey in 1831 noted that, of 240 doctors and nurses working in three cholera isolation hospitals in Egypt, only one nurse contracted cholera (Khalil 1948). This led him to think that the disease was not infective.

I have previously commented (Abdou 1947) on the frequency of intestinal bilharziasis and of pellagra among

cases of cholera in a certain village in Lower Egypt about which I have information. The 1600 inhabitants of this place live on 1200 acres—a rather high standard for an Egyptian village—but their relatively high economic and dietetic standard is offset by their obtaining their water from dirty canals, and multiple infections with intestinal bilharziasis, ankylostomiasis, amœbiasis, ascariasis, and malaria are common. Only one family, of 150 members, are free from parasitic infections, owing to a higher standard of living and to the care they take in obtaining treatment.

In the village as a whole the incidence of these infections in the age-group 8–20 years (about 350 in 1943) was:

Bilharziasis	78 %
Intestinal bilharziasis, including mixed infection	61 %
Pellagra	21 %
Splenomegaly	29 %

From Oct. 7 to Nov. 14, 1947, there were 52 cases of cholera, with 25 deaths (14 females, 11 males). Anyone over the age of one year who had diarrhoea and vomiting and died within two days is assumed to have had the disease. The distribution was:

	No. of cases	No. of deaths
Intestinal bilharziasis + other parasites + pellagra	16	9
Intestinal bilharziasis + other parasites, without pellagra	14	5
Adults not affected with parasites	1	0
Children aged 3–5 years	10	4
Children aged 1–3 years	11	7
Total	52	25

Besides the 21 children shown in this table (who had not been examined for parasites) 4 infants under a year old died in the same period, all apparently from diarrhoea and vomiting, and I was told that their illness lasted from a few hours to two days. The high incidence in children (over 40% of those affected) was also seen in other localities but not to the same extent.

Of the affected patients 90% came from the poorest class, the remaining 10% being slightly better off. All the 150 members of the leading family in the village, who were almost all free from parasitic disease, were spared in spite of their varied economic status. Compared with the other villagers they were no better protected by vaccine.

Immunisation with cholera vaccine started five days after the first notification: of the 1600 inhabitants 1300 received 1 ml. (8000 million vibrios) on Oct. 12 and about 1000 had a second injection on the 20th. The incidence and fatality-rate was somewhat lower in inoculated persons; but a high standard of sanitation seemed to be a better safeguard than immunisation. There were only 2 examples of the disease attacking more than one person in the same house at the same time: (1) 2 cases occurred at an interval of four days; and (2) 2 cases occurred at an interval of more than ten days. Household infection seems to have been rare also in other areas.

The reasons for the capricious spread of the disease are still obscure. Humidity, temperature, starvation, poverty, dirt, digestive disturbances, flies, and contamination of water and food provoke an epidemic but do not explain the selection of cases, or why in exactly the same circumstances some are spared, some suffer but slightly, some become healthy carriers, and others succumb in a few hours; or why among people living, eating, and drinking together, cholera so seldom attacks more than one person in the same house. The high incidence among children, parasite-ridden persons, pellagrins, people previously suffering from fevers, and starved people has also to be accounted for.

#### PORTAL OF INFECTION

There are two theories regarding the portal of entry of the cholera vibrio, the oropharyngeal and the

gastro-intestinal. The first is supported by Sanarelli (1926) on the ground that the acidity of the contents of the stomach is an insurmountable barrier to almost all micro-organisms. Work done in the laboratories of the Egyptian ministry of public health has in fact shown that cultivated vibrios die in a minute if placed in a 1 in 50,000 solution of HCl. Gastric acidity, however, is not constant. Histamine-fast achylia is present in 10% of people (Cecil 1942), or in 4% of apparently healthy persons according to Bennett and Ryle (1921). In the normal infant (Arnold 1929) free acid is absent and external temperature changes and infections tend further to reduce acid production and thus favour intestinal infection.

Acidity is at its lowest before the age of seven, and tends to rise at puberty, especially in boys (Bray 1931). Later, from adult life to old age, achlorhydria increases again, affecting 28% of males and 23% of females at the age of sixty (Vanzant et al. 1932). Hartfall (1932) found achlorhydria in 13.7% of patients with various digestive upsets, especially after forty.

The depressing effect of high temperatures and of smallpox vaccination on acidity has been confirmed by Yippe (1924), who found it to fall below the bactericidal point (pH 5.6-5.8). This well-known effect may explain the occurrence of dysentery after malaria and of enteritis following measles, or the appearance of cholera in two soldiers in Omdurman in April, 1914 (Roger et al. 1921), the first of whom was recovering from measles, and in only 1 soldier of the cordon of 3000 in the present epidemic, after an unknown fever. Oliver and Wilkinson (1933), in a comprehensive review, conclude that achlorhydria is commoner in women, in later life, in debilitating diseases, and in diseases of the liver and cholecystitis. All these, and pellagra too, are rife in Egypt.

In pellagra Biggam and Ghalioungui (1934) found histamine-resistant achylia in 52% of 26 cases; in none of these was there a similar condition in another member of the family, though they all lived under the same conditions and partook of the same diet. Of these 26 cases, 24 harboured intestinal parasites of which bilharzia and ankylostoma were the commonest.

Alport et al. (1939) found intestinal parasites in every one of their cases of pellagra. Biggam and Ghalioungui (1934) have also found that ankylostomiasis does not reduce gastric acidity unless complicated by pellagra, when acidity tends to disappear. Azmy et al. (1934) also confirmed the rarity of achlorhydria in uncomplicated ankylostomiasis, and Ghalioungui (1936) in that respect was later quite positive. The opinion has been expressed by Alport et al. (1939) that intestinal parasites play an important rôle in the causation of pellagra in Egypt by interfering with the absorption of a barely sufficient diet. They also noted the rarity of pellagra in non-infested persons and its high incidence in endemic localities. Their opinion is fully confirmed by my own observations in the investigated village. Further, Sidky (1947) has found that 35% of patients with bilharzial hepatosplenomegaly have no free gastric acidity.

These facts suggest that the stomach is the portal of entry. Many of the oddities of the spread of cholera are explained if we assume that the disease settles on people who—because of age, pellagra, bilharziasis, or other depressing conditions—have no free acid in the stomach. The relation between intestinal parasites and cholera was in fact observed long ago; Di Viesta (cited by Roger et al. 1921) pointed to the higher incidence of cholera among worm-infested people. This old observation can be applied to what is happening now in Egypt. The following table gives the incidence of intestinal bilharzia among patients in the endemic diseases hospitals in various parts of Egypt for different years (the only ones available), compared with the cholera morbidity and mortality per 100,000 in 1947:

	Incidence of bilharzia				Cholera morbidity	Cholera mortality
	1937	1945	1946	Average		
Damietta ..	52%	37%	17%	35%	554	288
Dakahlia ..	18%	12%	17%	16%	376	211
Siarkieh ..	9%	10%	8%	9%	315	158
Kalioubieh ..	8%	7%	6%	7%	181	55

The figures for bilharzia do not, by any means, represent the real incidence of the disease in these localities, but are sufficient for purposes of comparison.

This view is also supported by the findings of a group of investigators of the Kasr-el-Aini faculty of medicine (Gohar et al. 1948) that 75% of a group of contact carriers had complete achlorhydria, 17.3% had low acidity (less than 30 ml. of N/10 HCl), and 7.2% had normal acidity. None had hyperacidity. In a group of convalescents the figures were 82.5%, 11.6%, and 2.9% respectively. In the Philippines cholera experts claim that children, especially infants, show a higher rate of carriers (see Khalil 1948). This could be explained by the frequency of achylia and hypochlorhydria in children.

That some people contract the disease while others remain carriers is probably due to the state of their small intestine. Normally, if the stomach barrier is penetrated, defence forces in the intestines are still there to cast out the enemy: the duodenum is usually sterile, especially when empty. But when the intestine is irritated by toxic food contents, or during general infections, there is an increased secretion of mucus and organisms appear in the contents. Algid cases of cholera have been ascribed to these conditions. Experimentally, vitamin-A deficiency in dogs and cats leads to atrophy of the intestinal mucosa and favours infection. Arnold (1929) has shown that the power of the intestine to get rid of micro-organisms diminishes in hot weather; after alkaline-foods, and when the gastric acidity is low. Possibly a rise in pH may be the factor that leads to disease if high, to the carrier state if moderate, or to destruction of the vibrios if low.

#### SUMMARY

The 1947 epidemic of cholera in Egypt had a very erratic distribution. Study of a particular district shows that most of the victims were either parasite-ridden people, especially when pellagra, malaria, or old age was superadded, or young children, especially convalescents from measles.

Cholera seldom attacked more than one member of the same household living under the same conditions. This is also a feature of pellagra in Egypt.

Cholera vibrios are rapidly destroyed by stomach contents of normal acidity. Persons with low gastric acidity or achlorhydria are deprived of this defence against the disease and are therefore susceptible.

Achlorhydria may be due to causes common to all countries, such as childhood, old age, starvation, infections, general diseases, heredity. In Egypt it is, in addition, commonly due to parasitic infection.

If the vibrio crosses the stomach barrier, its further fate depends on many factors, of which the intestinal pH is perhaps the one that determines the development of disease, or of the carrier state, or the destruction of the vibrios.

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CLOSING THE PNEUMONECTOMY GAP

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THE chief complications of pneumonectomy are: (1) traction on, and emphysema of, the remaining lung, with disabling respiratory symptoms; (2) infection of the site previously occupied by the lung which has been removed (the gap); and (3) bronchial fistula (blown bronchus).

Methods hitherto devised of obliterating the gap included thoracoplasty and the instillation of various substances.

**Thoracoplasty.**—This does not always close the gap, and even if it does so corrective exercises are often necessary to prevent postural deformity with its secondary effect on the function of the remaining lung. Thoracoplasty does not always maintain the mediastinum approximately in its normal position or reduce any displacement of the mediastinum that may have taken place. It is generally considered unsuitable for patients with only one lung, because of their depleted respiratory reserve.

**Instillation.**—After pneumonectomy not followed by thoracoplasty the gap is naturally obliterated by a sero-sanguineous transudate from the surrounding tissues. This effusion seriously depletes the protein reserve of both plasma and tissues. To prevent this loss blood-plasma, with or without penicillin, has been instilled into the gap.<sup>1</sup> Both liquid paraffin intrapleurally and paraffin wax extrapleurally have been tried and discarded.<sup>2</sup> Johnson et al.,<sup>3</sup> in experiments on animals, tried a stainless metal box but found it unwieldy and irritating; so they substituted hollow spheres of methyl methacrylate, the results with which are still being observed.

In the case reported here an artificial pneumoperitoneum was induced postoperatively in an attempt to close the gap and was combined with Monaldi suction.

A man, aged 33, underwent a successful pneumonectomy on March 13, 1947. Routine postoperative treatment included daily adjustment of pressure in gap with artificial-pneumothorax (A.P.) apparatus, periodic aspiration of faintly blood-stained fluid, and daily instillation of penicillin into gap. Condition on March 15 is shown in fig. 1.

**March 27:** 2 weeks after operation an intercostal tube was inserted laterally in the 6th left intercostal space and connected to aspirating bottles on the floor, the diagnosis of blown bronchus having been confirmed by radiography.

1. Adams, W. E., Thornton, T. F. jun., Carlton, L. M. jun. *Ann. Surg.* 1945, 122, 905.
2. *Lancet*, 1947, II, 586.
3. Johnson, J., Kirby, C. K., Lazatin, C. S., Cocke, J. A. *Surgery*, 1947, 22, 179.

**April 13:** artificial pneumoperitoneum was induced (phrenic nerve had been crushed at original operation). Condition on April 17 is shown in fig. 2. During refills the pressure in gap was gauged intermittently by clipping off the drainage tube and inserting the A.P. needle into the tube proximal to the clip.

**April 29:** tube removed from 6th intercostal space and inserted anteriorly, in 2nd space, because it was thought that the tube in 6th space was preventing any further rise of the leaflet of diaphragm.

**May 3:** the fistula had closed and Monaldi suction was begun. The intercostal tube was connected to the Monaldi apparatus with, in series, (1) the first bottle, containing dilute lysol, for the effluent from gap; (2) the second bottle, a water-seal; and (3) the Monaldi pump.

Substitution of a flanged needle for intercostal tube in the 2nd space, at a distance from that tube, was considered, but the risk was thought to be too great.

At first, the Monaldi suction was used tentatively for 5 min. every 2 hours at low pressure, because a balance had to be struck between the suction of the Monaldi pump and the forced elevation of the diaphragm by the pneumoperitoneum, and because of the risk of reopening the bronchus. A radiogram taken on May 30 is shown in fig. 3.

To estimate the value of Monaldi suction in closing the gap and keeping it sterile it was temporarily discontinued; but, in spite of our increasing the artificial pneumoperitoneum, the gap enlarged and pus gradually reappeared and became thick.

**June 25:** postural drainage (see below) was combined with Monaldi suction. In mid-June track of tube in 6th intercostal space healed.

**Biopsy Specimens.**—Two specimens were extruded: one on July 3 alongside tube being shortened, and one on Aug. 26 when the tube was changed. The first specimen was a piece of fibrin with no organisation and no tumour cells; the second was granulation tissue with areas of squamous epithelium and no evidence of neoplastic cells.

About the end of August or beginning of September it was decided that the gap had closed. Monaldi suction was stopped on Sept. 3, having been kept up for 3 months. The pneumoperitoneum was last refilled on Sept. 9, having been kept up for 4½ months. The track of the tube in the 2nd intercostal space healed early in September. In September the patient was discharged and told to attend the outpatient department. His condition on Sept. 16 is shown in fig. 4. Contrast-medium radiograms made in December, 1947, and January, 1948, are shown in figs. 5-7.

**Jan. 7, 1948:** blood-count showed red cells 5,100,000 per c.mm.; Hb 102%; colour-index 1; white cells 11,200 per c.mm. (polymorphs 69%, lymphocytes 25%, monocytes 4%, basophils 2%). Erythrocyte-sedimentation rate 12 mm. in 1 hr. (Wintrobe). Blood-urea 27 mg. per 100 ml. Blood-pressure 130/85 mm. Hg. Vital capacity 1500 c.cm. (Pell's water pneumometer). Urea-concentration test:

Hour	Urea (g. per 100 ml.)	Urine (ml.)
0	1.7	280
1	1.9	87
2	3.2	50
3	2.8	37



Fig. 1.—Radiogram 2 days after pneumonectomy showing level of effusion.

Fig. 2.—Radiogram 4 days after artificial pneumoperitoneum.

Fig. 3.—Radiogram 27 days after start of Monaldi suction.

Fig. 4.—Radiogram about time of discharge of patient from hospital.

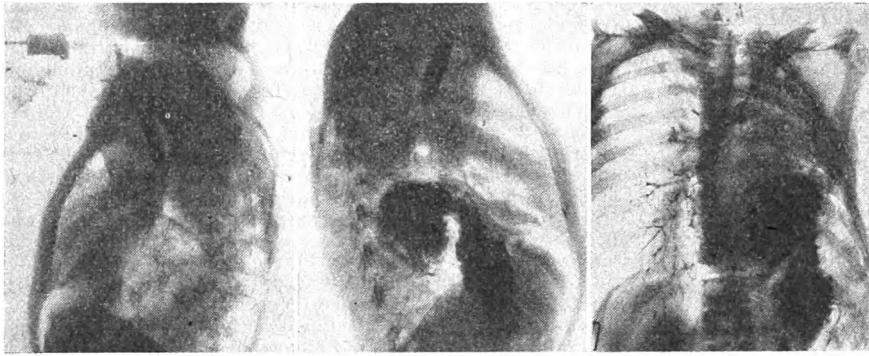


Fig. 5

Fig. 6

Fig. 7

Fig. 5—Horizontal left lateral bronchogram after introduction of 4–5 ml. of iodised oil, showing pneumonectomy stump.

Fig. 6—Left lateral bronchogram combined with barium meal, showing pneumonectomy stump and level of stomach.

Fig. 7—Bronchogram combined with barium meal. Patient was lying on his back for semi-oblique anteroposterior view to prevent complete spill-over of iodised oil, with head of table tilted slightly upwards to show pneumonectomy stump. Dark spots above barium-filled stomach are remnants of iodised oil from earlier sinography. Note level of stomach.

#### TECHNIQUE

##### *Pneumoperitoneum. Refills*

At first refills were given daily, then on alternate days, then twice weekly, and eventually at irregular intervals, according to the clinical appearance and comfort of the patient. The significance of the patient's comfort was not properly interpreted at the time, but I now feel that it showed that the leaflet had become fixed, that the pneumoperitoneum could be safely discontinued, and that the last lap in closing the gap depended on the maintenance of adequate suction.

The steps finally adopted as the most effective in giving the simultaneous pneumoperitoneum-Monaldi treatment are outlined as follows:

- (1) Refill with 400–600 c.cm.
- (2) Monaldi switched on, refill continuing.
- (3) Drainage-tube clip loosened when Monaldi clock was at 90 mark, while refill continued.
- (4) Refill stopped without pressure being measured, because eventually pressure was too high to take.
- (5) Monaldi kept going while drainage-tube clip was tightened.
- (6) With Monaldi still working, the tube to the glass connexion of the effluent bottle was disconnected and any pus, bloodstained fluid, or serum was drawn out distal to the tightened clip.

The amounts of air given in refills was usually 400–2000 c.cm.; on two occasions 3000 c.cm. was given.

A surgical belt was made to prolong the effect of each refill by adjusting it as the air was absorbed, so that it supported the viscera and maintained muscular tone as far as possible. This should have been applied much earlier—i.e., when treatment by artificial pneumoperitoneum was anticipated.

##### *Monaldi Suction*

At first Monaldi suction was given every 2 hours for 5 min. throughout the 24 hours; later every hour, gradually increasing until what was considered to be the optimal routine of 25 min. every hour was reached and maintained. Proper interpretation of variations in the nature and amount of the effluent indicated, in my opinion, that two sets of Monaldi apparatus with an alternating switch-over with almost continuous suction at a pressure of 80 or 70 mm. Hg, with absolute airtightness between the pump and the gap, would stimulate granulation-tissue production and a subsequent fibroblastic reaction in the walls of the gap; would keep the gap sterile; and would contract and distort the mediastinum less.

##### *Posture*

When the combined treatment with artificial pneumoperitoneum and Monaldi suction was started on May 3, the

novelty of the procedure and the unexpected degree of response led us to overlook the question of posture.

The first postures tried were: (1) sitting forward with as much flexion as possible; (2) lying on the "normal" side (i.e., leaning away from the tube side); (3) semisupine, supported by pillows; and (4) lying on the pneumonectomy side with adequate support to prevent kinking of, or accidental traction on, the tube. Of all these postures no. 4 was the most satisfactory, judged by the presence or absence of effluent and by the response shown radiographically after 2 min. each of postures nos. 1 and 2 and 10 min. each of postures nos. 3 and 4. It was found later that raising the foot of the bed 4 ft. stimulated the walls of the gap to granulate downwards from the apex, possibly owing to the presence of serum gravitating to the apex of the gap in this posture.

This was discovered late in the case after most of the granulation had been stimulated at the base and on the surrounding walls of the lower half of the gap.

On July 25 a routine including postures 1, 3, and 4, combined with raising of the foot of the bed was adopted, and it was found that progress was slower than before. This was attributed to induration of the walls of the gap, with consequent partial loss of power to respond with the production of healthy granulation tissue once suction had cleaned the gap. It was therefore decided to use the suction apparatus with the patient prone, the lower part of his body as far as the lower chest region being supported by his bed, and his head, neck, and shoulders by a chair and pillows. The response was unbelievably rapid, and the gap quickly narrowed to the size of the tube's bore. The Monaldi suction was maintained.

When the gap was considered to have been closed, interference to shorten the tube should not have been made, since, when it was attempted in the routine of treatment, it was found that the Monaldi suction had almost disengaged the tube from the sinus track, building up a wake of healthy granulation tissue, and the tube end (about 1½ in. long) slipped into the hand when grasped to ink-mark the skin-tube junction, the intention being to shorten it about this length. It was estimated that by continuing the Monaldi suction 5 in. of tube track was sealed up in 48 hours. The small superficial sinus rapidly responded to packing with hipp and dusting with sulphathiazole-proflavine 1%.

##### *Maintaining Airtightness at Skin-tube Junction*

At first plentiful gauze and cotton-wool, maintained in situ with elastic plaster, were used. This required daily changing as the dressing became pus-sodden. The best airtight dressing was a strip of ribbon gauze about 4 in. long wound round the skin-tube junction, the tube theoretically being kinked at the same time by fixing the patient's arm in abduction with the shoulder well retracted; the assistant dresser maintaining a double check by tightly holding the skin in the region of the tube. (It took long practice before the sound of air hissing back to the gap became a memory.) Strips of adhesive tape were built in a cone-shaped manner from the skin to the junction and along the tube; these were enveloped by larger widths of adhesive tape cut to the centre so that the arms of the tape could overlap round the tube, and about three or four large strips of elastic plaster (all divided to envelop the tube) extending from axilla to sternoclavicular junction, shoulder to mid-sternum, and nipple region to supraclavicular fossa.

##### *Changing the Tube*

Owing to blockage with debris the tube had to be changed on several occasions while it was in the 6th intercostal space. At this early stage of treatment the means of closure and the mechanics of the problem were not accurately foreseen. It was also not appreciated how difficult it was to maintain an adequate negative pressure in the gap. After the tube had been changed to the 2nd space anteriorly it became blocked four times. After the first blockage it was decided to insert a tube of larger bore to obviate further blocking and risk of losing the negative pressure when the tube had to be changed. The first attempt without a local anesthetic failed. So did the



second attempt, after the infiltration of skin and intercostal tissues with 2% procaine. So the smaller tube was reinserted.

At a subsequent blockage of the tube 10% cocaine minims 15 was instilled into the track through the blunt nozzle of a 1 ml. 'Record' syringe, the tissues round the track entrance being controlled by the fingers, and finally a rubber-tube drain with an inside diameter of  $\frac{1}{8}$  in. was successfully introduced. After this no further trouble from blocking arose. Previously, whenever a tube was changed, air was heard being sucked back alongside the tube into the gap, and each blocked tube when removed was found to be plugged from the first side-vent to the end of the tube with thick fibrinous clot.

#### Closure of Bronchial Fistula

This was ascertained by observation of the pressure in the gap by inserting the A.P. needle either into the clipped tube proximal to the clip or through the 2nd intercostal space anteriorly. Slow withdrawal of air from the gap with the A.P. apparatus (eventually up to 200 c.cm. before Monaldi suction was confidently started) showed that the higher negative pressure thus induced was maintained.

#### Indication to Begin Suction

Closure of fistula, tested as just described, was confirmed by clinical and radiographic evidence.

#### Indication that the Tube was Blocked

Absence of respiratory swing in, and bubbling of air through, the proximal glass connexion of the second bottle during suction indicated that the tube was blocked. The tube was clipped off near the skin-tube dressing when Monaldi suction was not in use.

#### Testing Efficacy of Pneumoperitoneum

When the bronchial fistula had been closed and Monaldi suction was being used, attention should have been directed to the efficacy of the pneumoperitoneum. By keeping the leaflet of the diaphragm at an optimal level in relation to the position of the mediastinum, a lower level than the one obtained would have caused less distortion and traction on abdominal and thoracic viscera.

#### Shortening the Tube

The tube was shortened in stages, according to the radiographic appearances. The skin-tube junction was marked with ink and the tube gradually shortened  $1\frac{1}{2}$ -2 in. when indicated. There was less danger here of air being sucked back if proper precautions were taken.

#### COMMENTS ON TREATMENT

No instrument was available to measure the optimal negative pressure of the gap. With the ordinary Lillingston-Pearson A.P. apparatus, when the negative pressure in the gap reached measurable range, no further diminution in the size of the gap took place; instead of no effluent or only some serum being sucked out, pus gradually reappeared, indicating that the negative pressure was insufficient. For the first half of treatment it was noted that serum draining after a day's Monaldi suction gradually changed to thinnish pus by the next morning. Therefore the routine of treatment found effective in the day-time was continued through the 24 hours, whereupon only serum, occasionally blood-stained, or no effluent at all was obtained.

When serial radiograms showed fixation of the leaflet at the level of the 7th rib posteriorly irrespective of pneumoperitoneum refills combined with Monaldi suction, the refills were continued; whether this was necessary or not could not be decided on the evidence of only one case; and, so long as the gap persisted, however rapid the narrowing, faith was fixed on the efficacy of the combined therapy until the gap finally closed.

*Adjuvant Treatment.*—At first penicillin was given both directly into the gap and systemically. Administration of intra-gap penicillin with its property of prolonging clotting-time and delaying fibrosis was probably responsible for initial delay in production of granulation tissue with subsequent organisation and consolidation.

*Infection.*—Organisms isolated from the pus included gram-positive and gram-negative bacilli, *Staph. aureus* and penicillin-sensitive and penicillin-insensitive coliform bacilli. On the final assessment infection of the gap was

controlled by using adequate suction to maintain a high negative pressure.

*Rest in Bed.*—Another factor belatedly recognised was that the rate of closing of the gap and the maintenance of a clean effluent were improved by rest in bed. When the patient was allowed up between his treatments, the rate of closing slowed down.

*Length of Treatment.*—The loss of time occasioned by experiments to find the optimal combination of Monaldi suction and artificial pneumoperitoneum, the best routine, and the solution of the difficulty of skin-tube airtightness probably means that the gap would have closed in less than 3 months and most probably within 2, if the final method of treatment had been applied in the beginning.

#### SUGGESTED PROCEDURE

From the experience gained in this case the following procedure is suggested for closing the gap left by pneumonectomy:

(1) If a phrenic crush has not been done at operation, it must be done postoperatively.

(2) When the patient has recovered sufficiently from the pneumonectomy, a pneumoperitoneum should be induced, and gradually increasing refills should be combined with meticulous control of the negative pressure in the gap.

(3) If there is no bronchial fistula, Monaldi suction through an A.P. needle should be started. Otherwise Monaldi suction must await healing of the fistula.

(4) When the combined treatment has been gradually instituted, the refills should not elevate the leaflet of the diaphragm excessively, the aim being to get the gap to close as much as possible by stimulation of its walls to the production of granulation tissue. The rate of closing should be observed by radiography, and the optimal combination of refills and suction controlled thereby. The optimal posture should also be discovered.

It might even be possible first to reduce the displacement of the mediastinum by energetic suction with the Monaldi apparatus, and, when embarrassment has been relieved, to induce a pneumoperitoneum and establish a balanced pneumoperitoneum-Monaldi suction ratio worked out along with a time-table of daily Monaldi usage.

In the present case immediate intercostal-tube drainage was a life-saving measure, because the mediastinum was becoming increasingly dislocated and the patient's condition ruled out any experiments.

If the gap is infected and there is no bronchial fistula, probably in most cases it will be sufficient to connect the Monaldi suction to a needle instead of to a drainage tube.

If there is a bronchial fistula, a drainage tube should be inserted into the gap high enough not to interfere with the ascent of the leaflet of the diaphragm. In the present case a drainage tube was inserted into the gap to relieve distressful dislocation of the mediastinum and embarrassment of the remaining lung, the bronchial fistula acting as a one-way valve during coughing spasms, trapping increasing amounts of air in the gap.

The chief difference when a bronchial fistula is present is that the pneumoperitoneum must raise the leaflet to the level of the blown bronchial stump and higher. Once this has been accomplished and the fistula has closed, two sets of Monaldi apparatus with a switch-over two-way metal adapter should be used to ensure continuous or almost continuous suction if this gives a better response (Monaldi pressures adjusted accordingly). If this can be done, possibly infection, inevitable with an intercostal tube, may not supervene.

If my idea of the action of this combined treatment on the walls of an infected cavity is correct, such therapy combined with localised thoracoplasty might be of use in treating tuberculous empyema.

I wish to thank Mr. A. L. d'Abreu, F.R.C.S., for his advice and information; Dr. J. E. Geddes, chief clinical tuberculosis officer, Birmingham, for permission to publish and for facilities for following up the case; and Sister H. Foley and Nurse B. Fitzsimons for their care of the patient.

## ELLIPTICAL HUMAN ERYTHROCYTES IN AN EGYPTIAN FAMILY

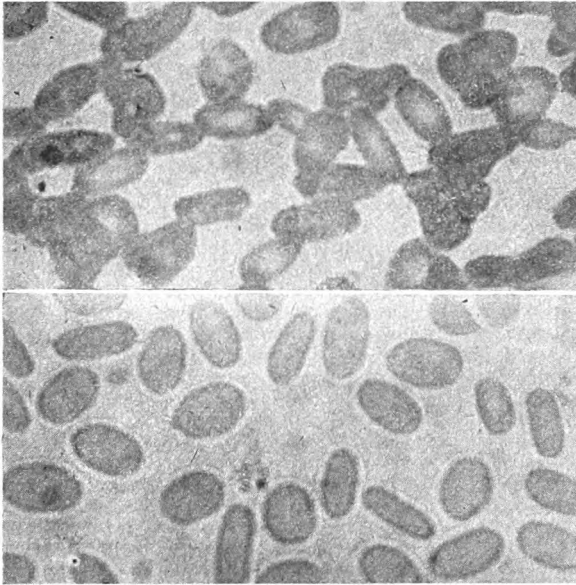
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IN the condition known as elliptocytosis a variable proportion of the red blood corpuscles are elliptical. This shape of red cell is normal in the camelidæ and was first described in man by Dresbach in 1904. Since then some 400 cases in about 50 families have been described.

The anomaly does not cause any disturbance in health, and it is always found in routine examinations of the



Elliptical erythrocytes shown in blood films of patient (above) and his mother (below).

blood. Its familial incidence was suspected by Dresbach and was proved later by many workers. Miller and Lucas (1938) found it in four generations in one family; Cheney (1932), Terry et al. (1932), and Hunter and Adams (1929) in three; and Lawrence (1931) in a boy and his grandfather. In the present Egyptian family it was found in three generations. Miller and Lucas (1938) consider that it is a racial characteristic in which, owing to a fault in erythropoiesis, some of the cells become oval as soon as they enter the circulation. Oval erythrocytes have never been observed in the bone-marrow (Cheney 1932, Helz and Menten 1944, Lawrence 1931, Terry et al. 1932).

The anomaly can be transmitted through either the father or the mother; it has no relation to blood-groups. All the cases described by McCarty (1934) were in negroes. Most of the cases reported were found in Europeans and Americans. It has not been described in Eastern countries or in oriental races.

Sickle-cell anaemia is readily distinguished by its limitation to negroes, the small number of abnormal cells which increase in sealed preparations, the increase in reticulocytes, and the presence of hæmolysis as shown by hyperbilirubinæmia and urobilinuria. On the other hand, in cases of elliptocytosis the number of red cells, Hb percentage, red-cell fragility, erythrocyte-sedimentation rate, total and differential leucocyte-counts, coagulation-time, and bleeding-time are normal, and there is no evidence of hæmolysis such as hyperbilirubinæmia and urobilinuria.

### CASE-RECORD

A male child, aged 10 years, was under treatment at the Children's Hospital, Fuad I University, for rheumatic carditis and chorea.

During a routine blood examination it was noted that more than half of the red cells in a dry film stained with Leishman were elliptical (see figure). A differential count showed that 70-75% of them were elliptical.

The same finding was reported in five other blood films taken during 20 days. In wet preparations the abnormal cells amounted to 90%.

**Hæmatological Investigations.**—Red cells 4,000,000 per c.mm., Hb 78%, white cells 7000 per c.mm. (polymorphs 50%, lymphocytes 42%, monocytes 4%, eosinophils 4%), platelets 200,000 per c.mm., reticulocytes 0.25%. Erythrocyte-sedimentation rate (Westergren) 5 mm. and 10 mm. consecutively after 1 and 2 hours; fragility test 0.4% sodium chloride; bleeding-time 1½ min., coagulation-time 2 min. Icteric index 4 units; van den Bergh negative.

**Parents.**—Father, aged 42, in good health, no abnormal finding. Mother, aged 36, had 85% elliptical cells in dry blood film (see figure). No other abnormal finding. She was in normal health, though somewhat undernourished.

**Grandparents.**—Only the maternal grandmother, aged 65, was alive. She had 15-20% of elliptical red cells in dry blood film. No other abnormal hæmatological finding. General health normal.

**Sibs.**—The patient had two brothers and one sister alive; one brother had died from bronchopneumonia at the age of 1 year, a sister from an accident at the age of 2 years, and another sister from an unknown cause at the age of 11 days. A living brother, aged 12 years, had 95% of elliptical red cells in the dry blood film; a sister, aged 6 years, 20-30%; and the other brother, aged 8 months, 70%. All these children were in normal health.

In all the cases the elliptical cells had average measurements of  $9.5 \times 5.5 \mu$ ; few of them reached  $14 \mu$  in the long diameter. Though no hæmatocrit measurements could be made, the general impression was that the elliptocytes had an increased volume (? macrocytosis).

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## PARTIAL COARCTATION OF THE AORTA WITH BACTERIAL ENDOCARDITIS AND BICUSPID AORTIC VALVE

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THE incidence of coarctation is about 1 in 1500 necropsies (Evans 1933). Hamilton and Abbott (1928), reviewing 200 cases in patients over 2 years of age, classified the degree of stenosis into complete, extreme, and minor, 22.5% of cases falling into the last group (lumen more than 6 mm. in diameter). Defects commonly associated with coarctation are bicuspid aortic valve (25%), anomalous origin of arteries, subaortic stenosis, and intracranial aneurysms. Bacterial endocarditis is reported in about 7% of cases.

### CASE-RECORD

A well-developed man of 25 was admitted to Farnborough Hospital on Nov. 25, 1946, with four weeks' history of joint and back pain and two weeks' severe epigastric pain and vomiting.

His previous history included a presumptive attack of rheumatic fever at the age of 9 years, when he spent two weeks in bed. He had always felt fit but was rejected for military service in 1940 and subsequently worked as a shop assistant.

On examination he was pale and sweating but not dyspnoeic. Temperature 98.8°F, pulse-rate 74, respirations 22 per min. Forcible apex-beat felt 5 in. from midline in 6th space. Signs of gross aortic incompetence. Rumbling apical diastolic

murmur. Blood-pressure 250/70 mm. Hg. No clinical signs of cardiac failure. Other systems normal. Spleen never palpated. No cutaneous petechiæ; no clubbing of fingers. Urine contained no albumin, pus, red cells, or organisms.

An important finding was that the femoral arterial pressure was much lower than the brachial. There was no difference between the two arm pressures. Blood-pressure is normally 20–40 mm. higher in the femoral than the brachial artery, and in aortic regurgitation the difference may exceed 50 mm. In this case, therefore, the pressure in the legs was very much less than would be expected. It was further observed that the pressures varied between 250/70 and 140/30 mm. Hg in the arm, and that these readings corresponded with systolic pressures of 170 and 110 mm. Hg in the femoral artery. There did not seem to be any emotional factor involved in these changes, and a cold-pressor test, when the pressure was at its lowest, did not elicit any response. The possibility of inaccurate readings due to an "auscultatory gap" was prevented by preliminary palpation.

Blood-urea and intravenous pyelogram normal. White-cell count 10,000–14,000 per c.mm. Hb level fell gradually from an initial reading of 92% Haldane (12.7 g. per 100 ml.).

The patient had a remittent pyrexia up to 101°F, but repeated blood-cultures were sterile. There was never any clear evidence of embolic phenomena except mild fingertip pain without objective signs. Subacute bacterial endocarditis was diagnosed, and the patient was given penicillin 60,000 units three-hourly from Dec. 27, 1946, to Jan. 23, 1947. Before the course ended the patient was practically symptom-free. Blood-pressure was then 170/45 mm. Hg. Immediately the penicillin was withdrawn, the pyrexia recurred and the patient's general condition deteriorated rapidly. He developed epigastric pain and vomiting and became dyspnoic at rest.

*Electrocardiogram* (Jan. 30).—Regular rhythm at 130 per min.; general low voltage with flat P and T waves; P-R interval 0.24 sec.; elevation of ST4 and inversion of T4 (lead 4R) was taken to indicate myocardial ischæmia.

Pulsus alternans and gallop rhythm were noted before the patient's death on Feb. 2, 1947.

*Necropsy Findings* (Feb. 4).—Body of a well-built young man. Well-marked signs of congestive cardiac failure; œdema of ankles and scrotum. About 20 oz. of clear yellow fluid in each pleural cavity, 6 oz. of similar fluid in peritoneal cavity. Lungs, liver (2240 g.), spleen (280 g.), and kidneys all showed well-marked venous congestion. Two fairly recent small infarcts in upper lobe of left lung.

Heart was generally enlarged; pericardium contained excess of clear fluid; many petechial hæmorrhages over visceral and parietal pericardium; right heart dilated, with both chambers full of clot; pulmonary valve and artery normal; left heart contracted and empty; vegetation 4 mm. in diameter at centre of anterior cusp of mitral valve, which was otherwise normal, with no abnormality of chordæ tendinæ; myocardium of left ventricle much hypertrophied (average thickness 2 cm.).

Aortic cusps contracted and thickened along free borders; aortic incompetence present; circumference of aortic orifice 5 cm.; large polypoid vegetation on ventricular surface of posterior right aortic cusp, with central perforation and spread of vegetation into corresponding aortic sinus. Anterior and left posterior (coronary) cusps formed a single segment except for two narrow bands which incompletely divided them into about equal parts. Coronary arteries normal. Heart weighed 700 g.

Ascending aorta measured 5 cm. in circumference. Scattered areas of atheroma present in ascending part and arch. Well-marked dimpling of endothelial lining over insertion of ligamentum arteriosum. Immediately below this level and below the origin of the left subclavian artery the orifice of the aorta was constricted by a narrow septum formed by the inner coat of the vessel; this reduced the diameter of the aorta to about half. Above and below the constriction the diameter of the aorta was about 2 cm. Just below the stenosis was a small vegetation on the anterior aortic wall. There was no evidence of any collateral circulation.

A firm well-circumscribed hæmatoma, about 1½ in. in diameter, was found in the root of the mesentery; it consisted of laminated clot and appeared to be fairly old.

#### DISCUSSION

In this case, though the coarctation was of minor degree (Hamilton and Abbott 1928), there was well-marked

hypertension. The cardiac hypertrophy was due to the combined effects of partial coarctation and of aortic insufficiency.

The clinical interest lay in the investigation of the hypertension. The pressure was considered too high to be entirely due to the aortic incompetence. This lesion may, however, cause systolic hypertension, which may occasionally be intermittent or paroxysmal. Aortic coarctation was considered unlikely, because the femoral pulses were present and the chest film showed neither rib notching nor absence of the aortic knuckle. The high pulse-pressure was a point against the coexistence of mitral stenosis. The mitral diastolic murmur was therefore of the Austin Flint variety. Though coarctation of the aorta seemed unlikely, the lower pressure in the legs cannot otherwise be explained. The absence of evidence of collateral circulation was thought to exclude this condition; but reference to the published work showed that up to 33% of cases might be of but moderate degree with little evidence of the development of an anastomotic circulation (Reifenstein et al. 1947).

The two loci resistentiæ minoris—the bicuspid valve and the aorta in the region of the stenosis—were both the site of bacterial endocarditis, the latter showing a small area of mycotic endarteritis. The hæmatoma found at the root of the mesentery was almost certainly due to rupture of a mycotic aneurysm of the superior mesenteric artery. It may have been related to the earlier abdominal symptoms.

We are indebted to Dr. J. F. Hackwood, medical superintendent, for permission to publish this case, and to Dr. D. O. Payne, house-physician, for detailed observation and records.

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## Reviews of Books

### Breast Feeding

F. CHARLOTTE NAISH, M.B. Camb. London: Oxford University Press. 1948. Pp. 151. 10s. 6d.

THE merits of this little book have already been officially recognised, for before publication it gained the Sir Charles Hastings Clinical Essay Prize of the British Medical Association. Dr. Naish is both a general practitioner and the mother of five children and she writes with authority. All concerned with the establishment and maintenance of natural feeding will profit from reading her book. It brings out both the psychological and the more mechanical aspects of the problem in a clear and convincing manner. Difficulties are faced and explained, and it is evident that the mothers among whom Dr. Naish has worked have been fortunate. Others can now share in the instruction they have received.

### Textbook of the Nervous System

*A Foundation for Clinical Neurology.* H. CHANDLER ELLIOTT, M.A., PH.D., associate professor of anatomy, Medical College of the State of South Carolina. Philadelphia and London: J. B. Lippincott. 1947. Pp. 384. 48s.

### Fundamentals of Neurology

ERNEST GARDNER, M.D., assistant professor of anatomy, Wayne University. Philadelphia and London: W. B. Saunders. 1947. Pp. 336. 24s.

BOTH these books are designed to present the structure of the nervous system and the functions which depend on that structure. They do not attempt to enter the field of clinical neurology, but they lead the student to it, and leave him well prepared. In both, simple expositions are succeeded by more detailed description, and there are many illustrations, photographs of specimens, and line diagrams.

Dr. Elliott's book, the larger and more detailed, is mainly concerned with structure. He has particularly

attractive serial diagrams of structures in the central nervous system, and his atlas of sections of the brain and brain-stem at the end will be found more helpful than the wordy descriptions which neuro-anatomy entails. He has achieved an admirable compromise between the large texts of neuro-anatomy and the inadequate introductions in the first few chapters of manuals of clinical neurology. Dr. Gardner's book is more concerned with function, and its form depends on physiological rather than anatomical divisions. It is smaller and less ambitious, for it does not really go beyond the necessities of the second professional examination. The author's interest in the history of the subject and the origin of names will appeal to many.

#### Handbook of Venereal Infections

R. GRENVILLE-MATHERS, M.D. Camb., A.R.I.C., venereal diseases officer, Watlasey. London: Sylvio Publications. 1948. Pp. 116. 12s. 6d.

THIS dogmatic and telegraphic little monograph is packed with facts useful both to students and practitioners. The subject is rightly approached from the medical angle, and the early and late manifestations of syphilis are succinctly and adequately summarised. On the other hand, old and new treatments are sometimes mixed rather injudiciously. It is disappointing not to find full investigation of the spinal fluid and radiography of the heart and great vessels insisted on as a prelude to the treatment of all so-called latent syphilis, and it is astonishing to read that suppuration usually occurs in monarticular gonococcal arthritis and that the possibility of obtaining a movable joint in such cases is poor. Dr. Grenville-Mathers is cautious in his attitude towards penicillin in syphilis, insisting on two standard courses of neoarsphenamine and bismuth in addition to 7 mega units of penicillin in early infections.

#### Medicine, Psychiatry, and their Borderland

ALEXANDER FRANK, M.D. Sydney: Shakespeare Head Press. 1947. Pp. 238. 21s.

THIS is an odd book, the outcome of much reading and reflection, but often gnomic and obscure. Such sentences as "reality of training exists in the culmination of probabilities" bemuse the reader; and the style, with its frequent mixture of the personal and the abstract, may remind him more of Paracelsus or Cardan than of any modern writer. The headings of the chapters are: case-taking, diagnosis, experimental research, statistics, marginal notes on history of medicine, psychology, social pathology, and therapy; but the treatment of these well-worn themes is highly individual. Now that books on psychiatry and "psychosomatic" medicine are profuse and as like each other as warts or daffodils, there is something to be said for a writer whose ideas are original, even if he is a poor hand at setting them down intelligibly. It is doubtful, however, whether Dr. Frank's views would seem so original if they were better digested and stated.

#### Malaria

W. K. BLACKIE, M.D., PH.D., honorary consulting physician, Salisbury Hospital, S. Rhodesia. Cape Town: African Bookman, for Post Graduate Press. 1947. Pp. 101. 10s. 6d.

Dr. Blackie gives a workmanlike description of human malaria, and deals in an orthodox manner with the parasitology, pathology, clinical features, diagnosis, and treatment of the disease. The account is concerned only with the manifestation of malaria in man, and consequently does not deal with epidemiology or the control of vectors. Despite its general competence, there are a number of things in it which detract from the standard and finish of the work. For example, *P. tenue*, a species of exceedingly doubtful validity, is illustrated though not described in the text; Leishman's stain is not mentioned; and there is no reference to blackwater fever as a complication of malaria. Neoarsphenamine is neither a hæmatinic nor one of the better antimalarial drugs, and the great value with which Dr. Blackie credits it in "chronic" malaria is therefore difficult to understand. The time lag of printing may account for omissions of several new and potent antimalarial drugs.

#### Technique d'irradiation des tumeurs malignes

CH. GUILBERT, ancien chef de service radiologique à l'Hôpital Lariboisière. Paris: Doin. 1947. Pp. 299. Fr. 650.

THIS book represents the clinical approach to the treatment of malignant disease by means of radiotherapy so well practised in France, but omits almost completely the physical approach to dosage. The röntgen as a unit of dosage is used in a description of given doses of X rays, but not to measure the dose delivered to a tumour or in the assessment of dose in treatment by radium. Within these limitations a good account is given of the methods used by Dr. Guilbert and his colleagues—methods which have obtained some of the best results on record. The details of treatment in various sites are interesting, and refer also to older methods. Points to be looked for are the techniques used for the irradiation of pharynx and larynx, with a wax collar to produce homogeneity throughout the treated zone, and the very careful and effective addition of electrocoagulation in the treatment of nævocarcinoma of the skin. The greater part of the work was done over 20 years ago and no recent publications in English are included.

#### Memoirs of an Army Surgeon

J. A. R. With a foreword by Lieut.-General Sir ALEXANDER HOOD. Edinburgh: W. Blackwood. 1948. Pp. 354. 15s.

THIS is a story of almost six years' soldiering, told with no purple passages, little introspection, and charity to all men. The author, in one unit or another, trailed the Eighth Army from the Nile to the Gothic Line and indeed is at his best in writing of movement by land and sea. The amateur writer has great advantages in such a tale, and the wonder of a great army on the march or the beastliness of the enclave at Anzio gain enormously from the artlessness of the telling; after all, Xenophon was no ink-stained hack. J. A. R. makes the technicalities of surgery comprehensible to any lay reader, and might have said even more about them since the changes in surgical practice in six years were a saga in themselves.

#### Rehabilitation of the Physically Handicapped

HENRY H. KESSLER, M.D., PH.D. New York: Columbia University Press. London: Oxford University Press. 1947. Pp. 274. 20s.

THIS book is welcome, particularly at the moment when a comprehensive National Health Service is about to be introduced. Dr. Kessler gives a convincing account of the value of organised and systematic methods of reablement, discusses the various classes of handicapped persons and their mental and social problems, lays stress on their potentialities in spite of their physical defects, and shows how they can become socially satisfied and economically independent. He believes that the profession is failing in its responsibilities in dealing with the problem of the disabled: even when treatment is adequate by medical standards, it is not organised towards restoring them to employment.

**Handbook of Communicable Diseases** (11th ed. London: J. & A. Churchill, 1948. Pp. 71. 5s.).—This handbook, issued by the Medical Officers of Schools Association, has long been a stand-by. Others besides school doctors will welcome this new edition, which gives up-to-date information on communicable diseases, medical responsibility and administration in connexion with them, general hygiene, disinfection, and notification.

**The Philosophy of a Scientist** (London: Hutchinson. 1948. Pp. 206. 16s.).—This book might be prescribed to be taken at leisure by those who feel lost in today's agnosticism and indifference. It is a readable and comprehensible account of modern scientific and philosophic conclusions. Surveying the evolutionary scene, Dr. R. G. Gordon sees evidence not only of purpose but of hope for unimagined splendours of achievement. Yet his book is practical, with clear directions for individual thought and conduct and a plan for the attainment of harmony and happiness. It presents the conclusions of an informed and reasonable mind, stressing the innate goodness of man and his oneness with and influence on the whole of creation.

# THE LANCET

LONDON: SATURDAY, JUNE 12, 1948

## The Third Spens

THE latest Spens report,<sup>1</sup> and its acceptance in principle by the Government, goes far to confound the pessimists who said that in a National Health Service the clinician must lose precedence to the administrator. To the intending specialist it offers a decent livelihood from the beginning of his training: in terms of 1939 money he is to receive £600 a year as a senior house-man, rising to a possible £1200 as a senior registrar. To the newly appointed member of a hospital staff it gives the assurance of an income rising steadily in eight years from about £1500 to £2500. And to every consultant and specialist it holds out the possibility of additional remuneration in recognition of outstanding ability or effort. Of the whole body of consultants and specialists, 20% will be selected for a "distinction award" of £500 a year, 10% for £1500, and 4% for £2500. Even if in translating these 1939 figures into their present equivalent, the Treasury were prepared to add no more than 20%, the 4% of consultants receiving the highest award could still command, for whole-time work, a net income of £6000 a year, or substantially more than the salary of the Minister who is in charge of the service. Those preferring part-time appointments are treated with equal consideration.

These sums, though substantial, are not extravagant. Many consultants have in the past earned much bigger incomes, and under the new régime, even with its better remuneration in early life, the community will probably pay little if any more to its specialists than it is now doing. There was grave danger that the Government's egalitarian tendencies might lead them to abolish all hope of gaining financial prizes in the public service, thereby forcing many of the ablest members of the profession, who have heavy commitments, to cultivate private rather than public practice. Hence the committee deserves warm thanks for persuading the Government to avoid a parsimony which would inevitably have lowered the prestige of the profession in the eyes of the public. On the other hand, those of us who accept the wisdom of this third Spens report, both in its principles and its proposals, may yet be anxious about its reaction on general practice. The previous Spens Committees have thought it proper that a general practitioner undertaking "full but not unusually heavy work" for 50-55 hours a week should, at 1939 values, earn £1800 a year<sup>2</sup>; yet by the age of 40 or a few years later the average specialist, whose work will on the whole be less arduous, will now earn at least £2500. The specialist's financial advantage is so obvious that many of the general practitioners who cultivate a specialty—and they are among the most capable—are already considering how to switch over from general to specialist practice. Keen competition

for specialist appointments is of course healthy, but it is essential that general practice should continue to attract a proportion of the very best men, and the income attainable must not become too unfavourable by comparison. Recognising this, the first Spens Committee held that the practitioner of exceptional skill and ability should be able to reach at least £2500 a year, at 1939 values; and this new report makes it more than ever necessary to ensure that his new terms of service will permit him to do so—without the overwork which is to everybody's disadvantage.

If "distinction awards" are to be conferred on a third of all consultants and specialists, great care will have to be exercised in judgment between the competing claims. This task, which is closely allied to that of establishing criteria for recognition as a specialist, is allotted by the Spens Committee to a predominantly professional committee whose professional members will be nominated by the Royal Colleges and Scottish Royal Corporations. A month ago we suggested that for such purposes it might be necessary to form a Council of Consultants and Specialists,<sup>3</sup> and in a letter published this week a correspondent reverts to the general question of the representation of specialists which we then raised. This discussion becomes more than academic now that the Minister is beginning consultations on fulfilment of the Spens Committee's recommendations. These consultations will be of great importance to the future welfare of the profession and the service alike, and it is good to see from the parliamentary answer printed on p. 928 that he is particularly concerned to find a solution of one of the major outstanding problems—the remuneration of the teacher. The committee records its belief that clinical specialists engaged in teaching "should receive increased total remuneration," but it was not called on to consider in detail the position of the medical teacher who is at present paid wholly or partly on university scales. The difficulties of changing this position are many<sup>4</sup>; but with national organisation of medical services it is indefensible that the doctors who have to teach the next generation should continue to be treated as poor relations.

## Tuberculosis in Two Wars

MODERN warfare, in itself the greatest of all pandemics, has caused much of the history of tuberculosis as a social disease to be rewritten. When the first world war broke out a mortality from this disease of under 100 per 100,000 living was still regarded as a target which only a few favoured nations could hope to attain, and four years of hostilities made this aim seem more remote than ever. Comparatively little was then known about vitamins and the protective value of foods, and to make matters worse the war of 1914-18 closed with a great epidemic of influenza, accompanied by all the respiratory complications of this disease. Nevertheless, ten years later the Health Organisation of the League of Nations published a mortality table showing that the lost ground had been recovered and in some quarters new gains had been won. Then came the deluge once more. This time the wholesale bombing of large towns and the attendant shelter life, the vast migrations of people, and the concentration camps

1. Report of the Interdepartmental Committee on the Remuneration of Consultants and Specialists. Summarised on p. 917.

2. See Report on Remuneration of General Dental Practitioners. 1948; p. 11.

3. *Lancet*, May 8, p. 715.

4. *Ibid.*, March 6, p. 374.

were added to the pangs of hunger. But fortunately this second world war, which brought so much chaos, did not bring any great pandemic, and tuberculosis stands out among the infective diseases as one of the major social disasters of the war.

Dr. MARC DANIELS<sup>1</sup> has described how UNRRA was called on to meet this disaster among the upheavals in Europe towards the end of the war. The first task was assessment of the damage. Dr. J. B. McDOUGALL reported on Greece, Dr. DAVID GOULD on Yugoslavia, and Dr. DANIELS himself on Poland and Italy and the displaced persons of Germany and Austria. It was, says DANIELS, as though those entrusted with the work stood outside the walls of a prison, wondering what horrors would be revealed when the gates opened. When at last liberation came it was found that from Holland across Europe to Greece the mortality from tuberculosis had risen steeply. The worst conditions were in Yugoslavia, Poland, and Greece. In Warsaw, for example, the tuberculosis death-rate, already at the high figure of 155 before the war, had risen to no less than 500 in 1944, while in Yugoslavia the rate had gone up from 189.6 in 1937 to 400 in 1944. Comparable statistics for Greece are not available, but the estimated rise, according to McDOUGALL, has been from 116.6 in 1938 to a present rate somewhere in the neighbourhood of 275. Again, in Vienna the increase was from 109 in 1938 to 257 in 1945. The enemy-occupied countries of Western Europe told the same tale on a much smaller scale, but already, thanks to an efficient pre-war organisation of preventive medicine which never entirely broke down, the tuberculosis mortality has fallen to its pre-war level. In France, indeed, it has dropped still further. Tuberculosis was responsible for 13.5% of all deaths in 1938 but for only 9.1% in 1945. The rise and fall of mortality in France has followed fairly closely the oscillations of the food-supply, and no doubt this relationship holds in other countries. In France, too, the increase in mortality during these war years was far greater in men than in women—57.5% against 15.7%. Holland, which had halved its mortality between 1930 and 1939, showed a steep and persistent rise during the war years, representing an increase of 134%. The situation in Italy is particularly important in view of its exceptional position on two sides of the war front during the six years. As might be expected, the major rise in mortality took place in the later years when war raged on her own soil; tuberculosis caused 11% of all deaths in 1939 and 16% in 1945. Of three groups of Italian cities—one in the north little affected by the war, another rapidly liberated in 1943, and a third which lay for a long time in the grip of war conditions—the rise in death-rate was least in the first and greatest by far in the third group. In England and Wales the total deaths for all forms of tuberculosis rose from 1939 to 1941, but fell again to the pre-war level by the end of 1942.

The German figures have been difficult to obtain and still more difficult to assess, since the claims have been supported by notification-rates, which are notoriously unreliable, and by the percentages of tuberculin reactors, the interpretation of which is equivocal. These statistics are obviously not compar-

able with mortality-rates. In his first report, in 1947, DANIELS stated that the German death-rate from tuberculosis rose from 50 per 100,000 in 1938 to 62 in 1942. The rate for Berlin went up to 257, but in the British Zone it was only 60, and in the American 56. The Control Commission, indeed, found little to corroborate the alarmist reports in the lay press. In the British and American Zones at that time there were, in fact, twice as many beds available for the treatment of the disease as in England. Last autumn Dr. DANIELS again visited the British Zone, in company with Dr. P. D'ARCY HART, at the invitation of the Foreign Office.<sup>2</sup> These two surveyors were satisfied that in Germany, with the possible exception of Schleswig-Holstein, the increase of tuberculosis as a whole, which was probably never as great as in the other combatant European countries, had been checked, though deaths from non-pulmonary forms of this disease were still increasing in some areas.

Miniature mass radiography surveys for Europe are still incomplete. The short table given by DANIELS shows that among the belligerent countries the incidence of significant tuberculosis requiring treatment has varied from 0.34% in Germany to 4.2% in Poland, whereas in neutral Sweden the figure is 0.3%, and for displaced persons in camps 2%. The concentration camps are beyond any cold statistical analysis whatever test is applied. A few isolated clinical and necropsy records suggest that at least 40% of the inmates had tuberculosis in one form or another, but the whole truth will never be known. Probably, therefore, we shall never be able to assess in figures the impact of the second world war on tuberculosis, just as we failed to do so in the first. As DANIELS points out, when the last calamity fell on Europe there were wide differences in the mortality in different countries—in Portugal, for instance, it was ten times as high as in Denmark. The facilities for record-keeping, too, have been so varied that accurate comparison is impossible. As a broad generalisation DANIELS suggests that among the European survivors of the late war there may be between five and ten million sufferers from tuberculosis, and imagination boggles at the thought of this source of chronic infection in the midst of the undernourished, ill-clad, and badly housed population of Central Europe. It seems as though the public-health services will need to be rebuilt from their foundations. In many places not only are the common necessities of food and clothing scarce, but medical stores and drugs, hospital equipment, and special apparatus such as X-ray plant are also lacking. The supply of this ordnance for the coming battle against tuberculosis may prove to be a fairly long-term programme. Meanwhile a short-term policy is required to meet the situation before next winter. One demand is being met in the supply of B.C.G. prophylactic vaccine, to which the Danish government laboratories at Copenhagen have already made contributions. Training of personnel for the new tuberculosis service, which must come into being at the earliest possible moment, is urgently needed. Here Great Britain with its old-established schemes and long experience might make a useful contribution, as it did after the first world war.

1. Daniels, M. *Tubercle*, 1947, 28, 201, 233.

2. See annotation, *Lancet*, March 13, p. 415.

## Prevention of Goitre

ESTABLISHED goitre and other thyroid enlargements are still prevalent in many parts of the British Isles, particularly in country districts. It is now debatable whether clinical enlargement of the thyroid gland in adolescence should be regarded as wholly physiological or as an over-adaptation to a deficiency; its incidence is high in goitrous areas where the water contains little iodine and very low in areas with waters of high iodine content, where adult goitre is rare. Lately the Medical Research Council has published the results of an inquiry<sup>1</sup> into the distribution of such conditions and their association with the content of iodine and other minerals in the drinking-water. As a rule surveys of established goitre at all ages are impracticable, since to be reliable they must involve house-to-house visits. It was found, however, that surveys of adolescents in schools, employing a standard method of recording, are eminently practicable. The incidence of simple hyperplasia may be accepted as an index of the "goitre hazard," or as reflecting the adequacy or inadequacy of the available iodine in the drinking-water of the localities concerned.

The M.R.C. report outlines a method for assessing the state of the thyroid gland using simple criteria. Any gland can be placed in one of four categories: (a) invisible at rest; (b) visible at rest but soft, smooth, and symmetrical; (c) conspicuously visible but still soft, smooth, and symmetrical; and (d) visible and classified as pathological because the gland is firm, nodular, or asymmetrical, or abnormal in respect of more than one of these characters. With such criteria, a survey has been made covering 1737 children aged 11-15 years in four areas of England served with waters of widely differing iodine content. The generally accepted inverse ratio between the incidence of thyroid enlargement and iodine content of the drinking-water has been confirmed. Similar surveys have also been made covering a wide area of England and some parts of Scotland and including nearly 4000 children aged 11-17 years. The incidence of thyroid enlargement and the iodine content of the water in the areas surveyed have also been considered in relation to the hardness of the water. The higher incidence of goitre and thyroid enlargement in some areas of England than in Scottish areas with waters of similar iodine content may prove attributable to the greater hardness of the English waters. The report presents fresh evidence showing the geographical association of endemic cretinism and congenital deaf-mutism with endemic goitre, and discusses the hereditary and environmental factors influencing iodine requirements. There were too few appropriate areas in the British Isles for the relation between endemic goitre and endemic fluorosis to be investigated.

The practical application of these findings is quite simple. As the goitre subcommittee of the M.R.C.<sup>2</sup> advocated four years ago, the general use of iodised salt as prophylaxis against thyroid enlargement and goitre is desirable in Great Britain. Already potassium iodide has been added to the vitamin A and D tablets

issued by the Ministry of Food for expectant mothers.<sup>3</sup> The M.R.C. now recommend the addition of either 1 part of potassium iodide to 100,000 parts of all common salt, sold or 1 part to 40,000 parts of all packeted table salt. Until this is effected, practitioners and medical officers of health in all districts where simple (endemic) goitre is common should encourage the regular use, at least by young children and adolescents, of one of the commercial brands of iodised table salt already on the market. It might also be well to include in the routine examination of all schoolchildren the simple method of assessing thyroid enlargement described in this report.

## Annotations

### ANIMALS IN THE LABORATORY

THE Universities Federation of Animal Welfare (UFAW), with Prof. A. N. Worden of Aberystwyth as editor, have collected in a handbook<sup>4</sup> all the information needed by those who use animals for experiment. This is an outstanding book, and one of which British medicine and veterinary science may be very proud. From the foreword to the appendix it is characterised by the richest sympathy with and understanding of animals; its last words are: "The writer will not have burned his midnight oil in vain if as a result even one rat the fewer shall be required in some experiment involving discomfort."

The first chapter, on the rights of laboratory animals, surveys the past and present laws in Great Britain and elsewhere relating to experiments on animals. In most countries, including the U.S.A., there are no relevant laws; and our memories of the callousness with which Nazi doctors experimented on human beings make it the more strange to note that Hitler signed a law enjoining the strictest kindness to animals under experiment. In our country, though man-traps were long ago made illegal, painful animal traps are still permitted. The passages in this chapter on the susceptibility of animals to pain should be read by all who undertake animal experiments. There are chapters on the design of animal-houses and control of pests, but the bulk of the work deals with the natural history, diet, breeding habits, and care of the smaller laboratory animals. Dogs, horses, cats, and goats, for example, are excluded, but full references are given to monographs on animals omitted. Those included are a motley and in some cases menacing collection. "Hedgehogs," we are told, "are the most disconcerting of all laboratory animals. Their wall of spines cannot be breached even by patience or guile"; but they may be induced to uncurl by tickling the spines over the rump. The black rat seems to run the hedgehog a good second: "When I received a bite," wrote the late Miss Kelway, "I considered I had failed" to avoid upsetting its temper. "It fixes its dark eyes upon you while it seems literally to sink its teeth into your bone." But this article, even in this gentle book, breathes an exceptional love of animals; Miss Kelway gave up gloves "and never expected to be bitten." The inclusion of the cotton rat and golden hamster are indications of the wide scope of the modern animal-house. The hamster may, alas, remain as one of the few perpetuated records of the work of Jerusalem's Hebrew University, whose buildings are today a field of war: all living domesticated hamsters derive from

1. Thyroid Enlargement and Other Changes Related to the Mineral Content of Drinking Water: with a note on goitre prophylaxis. By M. M. MURRAY, J. A. RYLE, B. W. SIMPSON, and D. C. WILSON. Medical Research Council Memo. no. 18. H.M. Stationery Office. 1948. 9d.

2. *Lancet*, 1944, 1, 107.

3. *Ibid*, 1946, II, 778.

4. UFAW Handbook on the Care and Management of Laboratory Animals. Editor: Alastair N. Worden, B.Sc., M.R.C.V.S., A.R.I.C., Milford professor and director of research in animal health, University College of Wales, Aberystwyth. London: Baillière. 1947. Pp. 368. 31s. 6d.

one family dug up near Aleppo. The use of the cotton rat in research on poliomyelitis has opened up new possibilities of investigation. The vole, the deer-mouse, the xenopus toad, and the canary receive their due attention; and, among the more unlikely references is one—from Russia—on the care of the earthworm.

It is becoming more and more obvious that those who work with living creatures, ever subject to idiosyncrasies of behaviour, must be prepared to analyse their results with all the help that mathematics can offer. But if one of the conditions attached to a licence to carry out animal experiments was that the applicant must comprehend this handbook's appendix on statistics there would be very few licence-holders. Many recent writers on medical education have urged the need for lectures on statistical methods, so the future may bring changes; but Major C. W. Hume, who as chairman of UFAW contributes the alpha and omega in this work, sadly overestimates the cultural and educational standards of most present-day laboratory workers. The fault is in us; certainly not in him.

This anxiously awaited volume fulfils every expectation; all laboratory workers will be grateful for it—and all animals should be grateful too.

### CHILD HEALTH SERVICES

RESOURCES and requirements of the child health services in their region are reviewed in a detailed survey<sup>1</sup> by the Berks, Bucks, and Oxon Regional Hospitals Council. The committee of surveyors, which was set up last year under the chairmanship of Prof. Alan Moncrieff, points out that in 1945 in this region 59% of deaths in childhood occurred before the age of one month (stillbirths 32%, neonatal deaths 27%). Immaturity is the principal factor determining deaths at this age; and the best means of reducing their number is by ensuring good maternal nutrition and by providing an efficient antenatal and obstetric service. Of the deaths in children between one month and fifteen years of age, 53% are due to infections (upper respiratory 30%, enteritis 10%, tuberculosis 8%, acute specific fevers 5%), 20% are due to accidents, and 12% are due to antenatal or natal conditions.

The surveyors observe that in maternity departments insufficient space has hitherto been allotted to the care of infants. Ideally, ward units should be small, so that babies can spend most of their time with their mothers. Nursery accommodation is, however, necessary, particularly for noisy infants at night; and for every 100 maternity beds there should be 10 cots for premature infants, for whose benefit human-milk bureaux should be set up in the larger towns. There is also urgent need for units to take non-infectious newborn sick infants, born at home. In the first five years of life, it is suggested, children should have nine medical inspections—one at the first attendance and others at 3 months, 6 months, 9 months, 12 months, and 18 months, and then at the 2nd, 3rd, and 4th birthdays. School medical examinations, of which there are three during the pupil's school life, are criticised as too superficial; and it is proposed that they should be replaced by one thorough examination, possibly combined with mass radiography. Every child should have its vision tested as soon as possible after education is begun.

To improve the liaison between preventive and curative services, the surveyors suggest that the key hospital of each area should have on its staff not only a paediatrician and a deputy but a number of senior assistants—probably of registrar status—who would spend about a third of their time in the hospital and the remainder

in coördinating the clinical work of the local health and education authorities; this link, it is claimed, would be particularly valuable if general practitioners played a greater part in the work of these authorities. Probably the best way of encouraging coöperation between the hospitals and the medical officers of the two authorities is for the hospitals to offer them clinical assistantships.

"It is felt that . . . the school medical service and the infant-welfare service should be staffed by those who have a special interest and skill in paediatrics, and who are at the same time doing clinical work. It is particularly urged that the work should not be done by whole-time officers, who are largely divorced from clinical medicine, and that where such officers exist, their duties should be altered so that they come into contact with clinical work in the hospitals. . . ."

Professor Moncrieff observes in his introduction that more information is needed on such questions as diet and nutrition, postural defects and physical education, and the care of the newborn.

"A regional scheme," he concludes, "will offer great opportunities for research, given academic collaboration at the centre, and some organisation such as an Institute or Child Health as an integral part of the university so that full coöperation with other departments—physiology, social medicine, education, and so on—can be obtained."

The picture emerging from the Oxford report is a sadly familiar one of shortages; what is needed is not only more research but more research-workers, more teachers, more doctors and other skilled workers, and, above all, more hospital beds.

### ELLIPTOCYTOSIS

SOME people, it seems, resemble the camel in having elliptical red blood-cells. The anomaly was first described in 1904 by Dresbach,<sup>1</sup> but it was really put on the map by Van den Bergh.<sup>2</sup> Over 400 cases have been reported, the latest group being that of Wyandt et al.,<sup>3</sup> who described 86 cases. It is, however, far from common; McCarty<sup>4</sup> found 4 instances of elliptocytosis among 10,000 bloods investigated; and Wyandt found 2 among 7000 persons whose blood was examined. Confusion has been caused because some writers call these cells "ovalocytes." It is now agreed that "elliptocyte" is the correct name, for the cells are not egg-shaped but are elongated elliptical biconcave discs, and the more elongated the cell the thinner the disc. The blood of people with elliptocytosis contains red cells of all shapes from round to very elongated, and the proportion of elliptocytes remains fairly constant throughout life. The elliptocytes are present at birth, but the full proportion does not appear for a time: for instance, Hunter<sup>5</sup> described a child who had only a few elliptocytes in the cord blood at birth, but at the age of three months had 43%; Wyandt and colleagues found 11% of these cells in the blood of a newborn baby, while four months later there were 80%. The elliptical form is a property of the mature red cells and does not appear in the normoblasts of the bone-marrow or even in the reticulocytes.<sup>6</sup> Elliptocytosis is definitely an hereditary anomaly which is transmitted by either sex, probably as a mendelian dominant.<sup>3,7</sup> It has been found in descendants of most European peoples and in those of Jewish or Negro origin. Hitherto it has not been reported from the Orient or the Middle East, but in this issue El Kholy describes examples among three generations of an Egyptian family.

1. Dresbach, M. *Science*, 1904, 19, 469.

2. Van den Bergh, H. *Arch. Verdaukr.* 1928, 43, 65.

3. Wyandt, H., Bancroft, P. M., Winship, T. O. *Arch. intern. Med.* 1941, 68, 1043.

4. McCarty, S. H. *J. Lab. clin. Med.* 1934, 19, 612.

5. Hunter, W. C. *Ann. intern. Med.* 1932, 6, 775.

6. Stephens, D. J., Tattelbaum, A. J. *J. Lab. clin. Med.* 1935, 20, 375.

7. Florman, A. L., Wintrobe, M. M. *Bull. Johns Hopk. Hosp.* 1938, 63, 209.

1. Child Health Services: a report of the Berks, Bucks, and Oxon Regional Hospitals Council of the Nuffield Provincial Hospitals Trust. Obtainable from the secretary of the Trust, 12, Mecklenburgh Square, London, W.C.1.



Three other hereditary red-cell anomalies are associated with hæmolytic anæmias—spherocytosis with congenital acholuric jaundice, drepanocytosis with sickle-cell anæmia, and target-cells with Mediterranean anæmia. For every patient with these syndromes there are many relatives who show no significant clinical abnormality but whose red cells are affected to a lesser degree. Several attempts have been made to add elliptocytosis to this hæmolytic triad and to describe an "elliptocytic anæmia." Hedenstedt<sup>8</sup> has reviewed the evidence and finds it very unconvincing; the best figures that can be quoted are those of Penfold and Lipscomb<sup>9</sup> who noted "slight jaundice" in 12% of their cases; Wyandt had a single case of true hæmolytic anæmia among 86 patients with elliptical red cells, but Hedenstedt dismisses this as accidental. There does not seem to be any true elliptocytic anæmia; on the contrary, elliptocytosis is a constant but not pathological abnormality that causes no disability. It is so constant that Hedenstedt transfused blood from these patients into other patients for estimations of red-cell survival.

Since elliptocytosis is a life-long anomaly, it is not surprising that it has been reported in patients with various diseases. Thus, Trincão<sup>10</sup> described the case of a woman with kala-azar and anæmia, 89.5% of whose red cells were elliptocytes; her parents and five siblings had smaller proportions of elliptocytes. Trincão could not find any evidence that the kala-azar had increased the elliptocytosis; such a combination is very rare, only one other case having been reported.<sup>11</sup> With its widespread racial incidence, elliptocytosis is possibly commoner than published reports indicate; for the anomaly is detected only when the affected person has his blood examined by someone who is alive to this oddity of the red cells.

#### SELECTION FOR THE CIVIL SERVICE

THE widening rings produced by Sir Percival Waterfield's<sup>12</sup> pebble, tossed into the tranquil pool of Oxford on March 21, seem to have ruffled more than a surface complacency. Sir Percival made his audience uneasy by reporting that 40% of candidates for the administrative service and 50% for the foreign service were complete failures; and that 60% of this group had held university or college scholarships, and 20% State scholarships. Indeed the selectors, he said, often looked at each other hopelessly, wondering how these young people were to get a living. Critics, however, wonder how far the new type of civil servant is successful in anything beyond satisfying the Civil Service Commissioners<sup>13</sup>; while an accepted candidate,<sup>14</sup> who tried the service and gave it up, complains that he was tested in quite a different set of qualities from those required for the job—the chief among which, in his experience, was "the ability to work out a series of intellectual crossword puzzles in conformity with a rigid routine and with little reference to their ultimate effect when translated into action."

The commissioners' "house parties" at Cobham are two-day selection boards in the course of which material is collected on each candidate by psychologists and selection officers. These methods were sharply criticised in the House of Lords debate which we reported last week. It is true that the methods used by the National Institute of Industrial Psychology, which are similar to those which then came under fire, have been largely validated. But industry is not the Civil Service; and those who spring to the defence of the new technique in the service will be poorly armed until validation is

achieved. The analogous War Office Selection Board method was open to fairly rapid assessment because those selected were destined for specific short-term jobs. In the Civil Service, on the other hand, selection is made with an eye to senior appointments. The qualities required of a third secretary are very different from those demanded of an ambassador, and the new method, based on preliminary job-analyses, must allow for the inclusion of men and women suitable for both these and other duties. Rapid judgment is thus impossible.

That scientific selection tests have great potential value is certain; that they are still imperfect is equally certain. Like Sir Percival Waterfield, we believe that ways of improving selection for university education should be studied. The Nuffield Foundation is sponsoring such an inquiry, and we hope later to describe similar investigations into selection as it affects our own profession.

#### TRANSATLANTIC HOSPITALS

Captain J. E. Stone, of King Edward's Hospital Fund, returning from a tour of visits to American and Canadian hospitals, has produced a detailed report<sup>1</sup> which deserves study by those concerned with hospital administration. It contains many illuminating hints. Thus at one hospital some thirty types of treatment-trays, designed by the doctors and nurses, are kept set up, ready for immediate dispatch, by a central supply service. In all hospitals, it seems, the plans for welcoming patients and their visitors are in advance of ours. There are comfortably furnished lounges for visitors, and in the entrance lobby there is always an information bureau with one pleasant girl or another continuously on duty. Usually there is also a flower stall and a gift-shop—selling stationery, journals, cigarettes, and so on—a public telephone, a drinking-fountain, and an up-to-date cloakroom. A cafeteria can be used by patients and visitors, and in one hospital there was a creche for visitors' babies, with a nurse in charge. At another hospital a stand carried health propaganda leaflets and had specimens of fruit and vegetables on view. "Many entrance halls," writes Captain Stone, "have paintings on the walls, and the whole area provides a pleasing appearance." In commenting on these amenities he says: "The main criticism which could be raised . . . is that they take up much space which might otherwise be used to greater advantage." Nevertheless, to people who are afraid for themselves or others, the value of a comfortable welcome is very great.

#### ULTRAMICROSCOPIC STUDIES OF TUMOUR TISSUES

THE demonstration by electron microscopy of minute particles derived from extracts of tumours and normal tissues of high-cancer strains of mice<sup>2</sup> has already been commented on in these columns.<sup>3</sup> Further progress with centrifugation and electron-microscope studies is now reported.<sup>4</sup> The critical centrifugation speed at which all particles were removed from the supernatant fluid of tissue extracts was somewhere between 60,000 and 100,000 times gravity. The size of the particles found in milk derived from the stomachs of the young of high-cancer-line mothers has varied from 200 to 350A, but some others up to 1200A have been seen. The occasional tendency to regular crystallographic arrangement is illustrated in one of the figures in the latest publication. Biological activity of all extracts tested has been examined concurrently in susceptible hybrids.

8. Hedenstedt, S. *Acta chir. scand.* 1947, 95, suppl. 128.  
9. Penfold, J. B., Lipscomb, J. M. *Quart. J. Med.* 1943, 12, 157.  
10. Trincão, C. *Amat. lusit.* 1947, 6, 329.  
11. Timpano, P. *Folliclinico*, 1940, 47, 1409.  
12. *Times*, March 22.  
13. *Ibid.*, April 9.  
14. *Ibid.*, April 7.

1. Report on Tour of Visits to Hospital Central Funds and Allied Organisations, Hospitals, &c., in the United States and Canada. Copies of the first section, "King Edward Planning and Construction," are obtainable, from King Edward's Hospital Fund for London, 10, Old Jewry, E.C.2. 1s.  
2. *Nature, Lond.* 1947, 160, 565.  
3. *Lancet*, 1947, ii, 835.  
4. *Nature, Lond.* 1948, 161, 759.

Some of these have now developed mammary tumours, but the results, together with control observations, are still incomplete. The value of the controls in this instance is to exclude the possibility that the test mice themselves carry the tumour agent. Some of the susceptible hybrids do so although they are supposed not to; therefore all must be suspect.

The original report mentioned the absence of particles in extracts of mammary tumours caused by methylcholanthrene. It might be extremely valuable if the observers could continue to examine concurrently extracts from spontaneous tumours due to milk factor, extracts from carcinogen-caused tumours of the mammary gland, and also milk from the stomachs of young mice suckling either a mother with a primary tumour of the mamma of chemical origin or, if this is impossible, bearing a transplanted tumour of chemical origin. The mammary gland of the mouse and the skin of domestic rabbits are at present the only sites from which data relating to mammalian tumours caused by virus and by chemical means can be collected and compared. In the present state of our knowledge it seems important to find out whether any minute agent is associated with the chemically-caused tumours.

#### G.N.C.'S REPLY TO WORKING PARTY

In their comments on the Working Party's report, the General Nursing Council, as befits the statutory licensing body of the profession, have concentrated on the recommendations dealing with the nurse's training, and with their own functions and constitution. Towards most of the proposals their attitude is tinged with reserve. Two years they hold to be inadequate even for a basic training, for it would allow the student nurse to spend only 30 hours a week for 51 weeks on nursing practice. Further the elimination of repetitive duties on which the proposed reduced training is based would rob the student nurse "not only of the ability to nurse but of satisfaction in nursing." The council also disapprove of the proposal that a license to practise should be issued after two years' training (followed by State registration) and a third year under supervision. According to this plan, they say, a nurse who chose public health as her specialty would be entitled to nurse any type of patient after having spent only 18 months of her training within a hospital, while the difficulties involved in ensuring that people who had not obtained the licence did not nurse without supervision would be almost insuperable.

With the general content of the training suggested by the Working Party the council are in agreement, and they set out recommendations for a three-year course which they would consider adequate. Such a training would, however, be basic, as compared with their previous proposals for a four-year comprehensive course, and the nurse would still be required "to establish her knowledge and practise her skill." The council think that any type of hospital—general, sick children, tuberculosis—might act as the major school of a training group, the minimum period to be spent by the student in each branch being laid down by the council. Under this system they propose that the present affiliated and associated schemes of training should end, and that the supplementary parts of the register should be closed with the exception of the register of mental nurses. For mental nurses they suggest a three-year course consisting of 18 months' basic training as laid down in the Working Party's report followed by 18 months' training in mental nursing. A general-trained nurse who wished to qualify as a mental nurse would have to take the full additional 18 months' specialised course. The education and examination committee of the council add that they see no reason why eventually all mental nurses should not undertake the full course in general nursing: the register for mental nurses would then also

be closed. But the mental-nursing committee are emphatic that this is not at present practicable.

Turning to the Working Party's proposal to set up national advisory committees for nursing, the council emphasise that as the statutory body responsible for the examination of nurses they must also be responsible for the education of nurses. Confusion would be created throughout the country unless they continued to lay down national standards for admission and training, and inspection of training schools must remain under their jurisdiction. Their functions could well, they suggest, be widened to empower them to "encourage research into training measures and to approve the conduct of experiments relating to nursing training within training schools." The proposal that there should be one General Nursing Council for Great Britain they turn down as too unwieldy: it is already possible for the Ministers of Health and Education and the Privy Council to appoint members representative of the universities. They agree that the recruitment of assistant nurses is unsatisfactory but to discontinue this grade of nurses would result in the care of chronic sick being entrusted chiefly to untrained people. The two years' training of the assistant nurse cannot be reduced, but her remuneration might be increased to balance her limited prospect of promotion. It will be necessary to have an ancillary service of ward orderlies but not nursing orderlies.

The council end by drawing the Minister's attention "to the fact that the report of the Working Party would appear to have been drawn up with insufficient thought of the needs of the patient which in fact form the basis on which any conclusions relating to nurse training must be built." It seems, however, that one may think at length about the patient's needs without going far enough to meet them.

#### WATER POLLUTION RESEARCH

PREVENTIVE medicine has many angles and the report<sup>1</sup> of the Water Pollution Research Laboratory shows how closely its varied work concerns our health and welfare. The growth of industry, whether in Britain or in the actively developing parts of the Empire, such as East Africa, raises problems of water pollution which can be solved only by experience and patient investigation. Proper methods of waste disposal have greatly helped in the control of many infections, but epidemiologists think there is still much to be learnt about disease by studying sewage. The modern sewage plant with its percolating filters attracts flies, and the new insecticides such as D.D.T. and 'Gammexane' are being used to destroy them. Chlorination of sewage effluents has always seemed desirable, but substances toxic to fish and other organisms may be formed in the process. Effluents from many sorts of industrial plants cause trouble, and the removal of cutting oil from machine tools or of pollution from sugar-beet factories are among the recent problems which the laboratory has had to tackle. Its chief aim, however, is research of a fundamental character.

The Ministry of Health announces that 10,459 general practitioners in England and Wales had joined the medical lists of executive councils by June 5. A week earlier the total was 6209.

THE Royal Society is holding in London from June 21 to July 2 a Commonwealth conference on the distribution of scientific information. The work of the conference will be divided into four sections dealing with publication and distribution of papers reporting original work; abstracting services; indexing and other library services; and reviews, annual reports, &c. Further information may be had from the assistant secretary of the society, Burlington House, W.1.

1. Report of the Water Pollution Research Board for 1946. Department of Scientific and Industrial Research. H.M. Stationery Office. 1948. 1s.

## Reconstruction

### CONSULTANTS' AND SPECIALISTS' REMUNERATION

#### SPENS COMMITTEE REPORT

LAST week the Minister of Health announced that the Government accept in principle the recommendations of the Spens Committee appointed a year ago to consider the remuneration of consultants and specialists in a publicly organised service.

Sir Will Spens presided over this committee, and its eleven members included Prof. D. Murray Lyon, P.R.C.P.E., Lord Moran, P.B.C.P., Sir Harry Platt, F.R.C.S., Dr. S. Cochran Shanks, F.F.R., and Mr. J. R. H. Turton, F.R.C.S., with Dr. D. P. Stevenson, of the British Medical Association, as one of the secretaries. Statistical information on the income of consultants and specialists before the war was supplied by the Evidence Committee set up by the Royal Colleges and the British Medical Association, whose inquiry was guided by Prof. A. Bradford Hill, D.Sc.

The recommendations<sup>1</sup> are framed in terms of the 1939 value of money. The committee did not feel competent to say what adjustment of pre-war incomes would be required to produce corresponding incomes today; but it points out that the adjustment necessary must take account not only of the change in the value of money but also of the increases which have in fact taken place since 1939 in incomes both in the medical and other professions.

#### GENERAL CONSIDERATIONS

The committee came to the conclusion that it could not consider what remuneration is appropriate for specialists of staff status without also considering what they receive while in training for their specialty. So its report covers the whole group of doctors who after completing junior house-appointments take hospital posts in training for a special branch of medicine. It was much impressed by the drastic selection to which specialists in the early part of their career are subjected, and by the risks, hardships, and uncertainties involved in building up a private practice.

"It was strongly stressed in evidence that the remuneration attached in the past to the junior hospital posts held immediately after completion of house appointments had borne little relation to the progressively increasing responsibilities of these posts, to the standard of living required of the practitioner, and to the need for freedom from financial worry during this extremely important part of his career. We were told that many potential specialists are diverted into general practice at an age when marriage is contemplated and the emoluments attached to training posts are not sufficient to meet new responsibilities. These difficulties are progressively accentuated throughout the training period, and when the registrar posts are reached the practitioner is normally compelled to rely upon his private financial resources or to undertake much outside work such as coaching to enable him to meet his financial commitments. We were informed that hospital registrars before the war received £300 to £400 or less, even in non-resident posts."

Moreover a fully qualified specialist has often had to wait several years for a suitable hospital appointment, and even when this was secured his earnings from private practice have seldom met his overhead expenses. The period of preparation is necessarily very long in certain branches such as neurosurgery; and in most specialties it has been proposed that no-one shall be recognised as a specialist until he has had at least 5 years' training after qualification, or 11 years' professional training in all.

The inquiry into 1938-39 incomes showed big differences in earnings in different specialties. (Thus the tables

show that for men aged 45-50 the mean net income was £3341 for surgeons, £2355 for physicians, £4082 for gynaecologists, £2231 for ear, nose, and throat surgeons, £2403 for ophthalmologists, and £1900 for other specialists). But the committee thought it would be a mistake to base future remuneration on these differences, since some of the branches were formerly underpaid, and in many of them the prospects have greatly changed since before the war. It also agreed with the Evidence Committee that the retiring age should not vary but should be 65 in all the specialties.

"We eventually reached the conclusion that in view of the standards of qualification and the length of training now proposed for the various special branches it would be unfair to recommend that any specialty should be relegated to a subordinate place in Medicine by denying its members access to the highest levels of remuneration. We are certain that unless all specialists in whatever branch of Medicine they practise have an opportunity of reaching the highest levels of remuneration, the ancillary specialties, however important, will find it difficult to attract sufficient recruits of suitable calibre. The principle upon which we decided to base our recommendations was that all varieties of specialists should be remunerated within the same range of incomes, the place of an individual within this range being dependent upon his responsibilities, experience and skill. Thus the highest remuneration would be open to specialists in all fields although the proportion attaining that remuneration might be less in some fields than in others and might vary with the increasing importance of this or that branch of Medicine."

The consultants and specialists who undertake domiciliary visiting should receive some additional remuneration for it.

The committee also decided against differentiating between the staffs of different kinds of hospitals (e.g., teaching and non-teaching). The intention underlying the National Health Service Act is that specialists should be better distributed throughout the country, and that the influence of the university centre should permeate the hospital service of each region. "These objects can be achieved only by increasing the mobility of specialists throughout the service and facilitating the interchange of staffs between teaching and non-teaching hospitals." The status of the area hospital centre should be in no way inferior to that of the teaching hospital, and both should be able to attract specialists of the highest calibre. The same range of remuneration for clinical work should apply in both.

#### THE SPECIALIST IN TRAINING

The committee holds that in a public service intending specialists who do not possess private means should not be called upon to pass through a stage of comparative penury and hardship; nor should they be tempted to spend too much of their time in supplementing their income (e.g., by coaching). "The medical practitioner, between the completion of his first house appointment and appointment to the staff, should be paid a salary which is not merely in the nature of a training grant but which reflects both the growth in his skill and the increasing responsibility of his work." By encouraging interchange of specialists between hospitals, every effort should be made to minimise and equalise the period during which the trained registrar waits for a staff appointment; but it is necessary to safeguard his position while he does so.

The committee proposes that doctors in training for specialist work should receive:

(a) a fixed salary of £600 per annum during their tenure of those hospital posts which are normally obtained not less than one year after registration and are normally held for one year only (e.g., senior house officer, resident medical officer);

(b) a salary of £700 rising by one annual increment of £100 to £800 per annum during their tenure of those hospital posts which are normally obtained not less than

1. Report of the Interdepartmental Committee on the Remuneration of Consultants and Specialists. Cmd. 7420. H.M. Stationery Office. Pp. 30, 6d.

two years after registration and are normally held for two years (e.g., assistant, junior registrar);

(c) a salary of £900 rising by two annual increments of £100 to £1100 per annum during their tenure of those hospital posts which are normally obtained not less than four years after registration and are normally held for three years (e.g., first assistant, chief assistant, senior registrar). If such a post is held for more than three years the salary should rise by one further increment of £100 to £1200 in the fourth year, and remain at that figure in any further years.

These salaries would be reduced in respect of residential emoluments.

#### RANGE OF REMUNERATION FOR HOSPITAL STAFF

Believing that "the adequacy of the remuneration for the first few years will more than any other factor determine the attitude of the practitioner who is considering whether or not to embark upon the arduous path of specialisation," the committee recommends that on appointment to the hospital staff a specialist aged 32 should receive £1500 per annum.

"In the exceptional case where a specialist is appointed to a hospital staff at the age of 30 or below we recommend that the starting salary should be £1250, rising by annual increments of £125. It would follow that if a man were appointed at the age of 31, he would receive £1375 on appointment, and £1500 at 32. It may often happen that a specialist will not attain a staff appointment for some years after the age of 32. In that event we recommend that the hospital authorities should have freedom to vary the initial salary of £1500 by allowing up to four special increments of £125 each in respect of age, special experience and qualifications."

In the past a small proportion of specialists have earned very large incomes.

"Bearing in mind that the salaries we have recommended above would remove the hardships at present experienced during the period of training; that in a public service the specialist ought not at any stage of his career to require to supplement his earnings by private means; that his remuneration will be maintained at a consistent level until the age of retirement is reached; and that throughout his career the specialist will enjoy financial security in marked contrast with the uncertainties of private practice, we concluded that some reduction was justifiable not only in the ceiling figure of the incomes attainable in the past, but also in the proportion of consultants attaining to the highest levels of remuneration. On the other hand, we would emphasise that if the best possible recruits are to be attracted to specialist practice, there must remain for a significant minority the opportunity to earn incomes comparable with the highest which can be earned in other professions. There is a further point to which we attach great importance. We are convinced that the remuneration offered to specialists of exceptional ability must be sufficient not only to attract the most able specialists of this country to the public service, but to maintain the position of British Medicine in a competitive market which includes the Dominions and the United States of America."

The committee concluded that "specialists of the highest eminence should be able, in the public service, to aspire to a remuneration of the order of £5000 for clinical work."

#### DIFFERENTIATION WITHIN THE RANGE

Thus the range of incomes suggested is £1500-£5000. Within that range how should the income of a particular specialist be determined?

Ability and effort differ widely, and if the recruitment and status of specialist practice are to be maintained specialists must feel that more than ordinary ability and effort receive their reward, and that the criterion is not mere age and length of service. Nevertheless, in the years after his appointment, the specialist continues to gain experience which enhances the value of his work, and the committee feels that, besides some means of recognising and rewarding exceptional individual merit, there should be during the earlier years a uniform scale of annual increases applicable to all specialists alike.

Accordingly it recommends that the initial salary paid on appointment to the staff should be raised by £125 after each year of service until a maximum of £2500 has been reached, after which remuneration would cease to depend in any way on length of service.

Remuneration in excess of the basic incremental scale would be given only for outstanding professional ability, and it is essential that the means adopted for selecting individuals for exceptional reward should command the confidence of the profession. The committee proposes that the task of selection should be entrusted to a national committee, consisting in the main of eminent members of the profession, who would be able to reach an authoritative opinion on the comparative merits of candidates. The professional members of the committee should be nominated by the Royal Colleges and the Scottish Royal Corporations, and it should also include a representative of the universities and a representative of the Medical Research Council.

In recognition of special contributions to medicine in the field of research or otherwise, exceptional ability, or any outstanding professional work (other than administrative) this committee would confer awards in three grades. The first and highest distinction should carry with it an award of £2500 per annum by way of addition to the basic salary, the second an award of £1500 per annum, and the third an award of £500 per annum. All specialists of staff status would be eligible for these distinctions and for the monetary awards attaching to them. Those working part-time in the service would receive an appropriate proportion of the award.

The Spens Committee thinks that in order to preserve a proper distribution of incomes throughout the entire range of remuneration, the number of distinction awards conferred should be a fixed percentage of the total number of consultants eligible, and it recommends that 4% of all consultants eligible should be selected for the first distinction, 10% for the second distinction, and 20% for the third distinction. This would mean that approximately a third of all specialists will receive more than the basic salary of £2500.

#### TEACHING

A difference of standard of specialist service at teaching and non-teaching hospitals can be avoided only if equivalent clinical work at the two types of hospital attracts the same remuneration. The committee, however, does not think that equality of status would be prejudiced if a combination of clinical work and teaching (undergraduate or postgraduate, professional or non-professional) attracted higher total remuneration.

"We are doubtful, indeed, whether it will be possible to secure the best men for teaching unless they receive higher total remuneration. We have no doubt that teaching is an additional burden on the specialist, and calls for special aptitude and skill. In the future, as postgraduate teaching is extended, most hospitals will undertake a share of this work, and the proportion of specialists who would be eligible for additional emoluments for teaching would be correspondingly increased. We envisage, of course, that clinical teaching officers will be eligible for the special distinction awards. . ."

#### PART-TIME WORK

The committee points out that the responsibilities and commitments of a part-time appointment cannot be measured, in relation to those of a whole-time appointment, simply by comparing the total working hours of the part-time specialist with the total working hours of his full-time colleague. The holder of a part-time post has a continuous responsibility for the patients in his charge, and he must be expected to take his share in the committee work of the hospital.

On the assumption that a specialist in whole-time service would undertake a working week of 11 half-days, the committee suggests that the part-time specialist

should be required to devote to the service a specified number of half-days per week. If  $x$  represents this number, his basic remuneration should be  $x/11$  of that received by a whole-time specialist of like status, plus a quarter of  $x/11$  or a quarter of  $\frac{11-x}{11}$ , whichever is less.

Circumstances might arise where a higher rate should be paid to individual specialists on a personal and in some cases temporary basis. (For example, acceptance of a part-time contract might depend on uncertain prospects in building up or maintaining a private practice in a particular locality.) The committee therefore thinks that hospital authorities should be free to offer a higher rate, at least temporarily.

#### EXPENSES, SUPERANNUATION, AND HOLIDAYS

A number of expenses must be met if the specialist is to perform his duties efficiently. These include car expenses; expenses of travel apart from the use of a car; the cost of renewal of instruments and other equipment; the cost of books and journals, preparation of scientific papers, and subscriptions to professional societies; printing, stationery, postage, and telephone costs; expenses of attendance at national and inter-

national professional meetings; and the expenses of visiting hospitals and clinics at home and abroad, and entertaining visiting colleagues. These expenses might be refunded after they have been incurred, or alternatively appropriate allowances might be attached to the various posts, with additional provision where necessary (e.g., for attendance at an international conference). "It is presumed that the Inland Revenue authorities would be prepared to consider favourably as legitimate allowances for income-tax purposes any items of expense which had been approved by a public hospital authority."

In its proposals the committee has assumed that, as in private practice in the past, specialists will themselves have to provide by insurance against death and old age. In so far as this ceases to be so, adjustment of salaries will be necessary.

The committee has also assumed that the specialist will be entitled to certain definite holidays, and will not be financially liable for providing a deputy. It adds that "apart from normal holidays, extended leave will in the interests of the service be necessary on occasion for study or research."

## Special Articles

### THE PHYSIC GARDEN AT CHELSEA\*

W. S. C. COPEMAN

O.B.E., M.A., M.D. Camb., F.R.C.P.

THIS garden, which has been cultivated for 265 years, formerly supplied the Society of Apothecaries with the herbs used in their laboratory at Blackfriars. The term "physic garden," however, need not be connected with the growing of drugs. In Jacobean times, when it had its origin, it was more generally used in the sense of appertaining to physical (i.e., natural) science—a botanical garden. The main reason for such gardens was to advance botany and to teach students the names and natures of plants.

Nevertheless, since it was widely believed that Divine Providence had decreed that every plant should have a medicinal property which merely awaited discovery, pharmacology and botany were to some extent synonymous. Hence it was natural that the "medicine men" were among the chief teachers of the science, and the Royal College of Physicians cherished a physio garden from their foundation in 1518 until its loss in the Great Fire of London, Gerard the Herbalist being its first curator.

#### THE APOTHECARIES' GARDEN

In the reign of James I the preparation and marketing of drugs and herbs was still the business of the Grocers Company. But it appeared to His Majesty who was no mean scientist that "many empiricks and ignorant men do make compound, unwholesome, hurtful, deceitful, corrupt and dangerous medicines to the great peril and hazard of our subjects," and a charter was granted for the establishment of the Worshipful Society of Apothecaries in 1618. The qualifications for membership were strict, and the Royal College of Physicians were requested to provide examiners, and appoint officials to help arrange botanical excursions for students and apprentices. As many plants of interest to apothecaries were not to be met with in these "herbarising" expeditions round London, the society eventually set out to find a garden where such specimens could be cultivated and where foreign seeds could be grown. In 1673 it leased this 3½ acres of waterfront at Chelsea for £5 per annum from the second Lord Cheyne. This was stocked by the generosity of private members and exchanges were arranged through the distinguished foreign botanists whom its fame soon brought to England. The first cedars of Lebanon to grow in this country were planted in 1683 in the garden (the last of them only died in 1903), whilst a cinchona

tree growing in a house ingeniously heated is mentioned in Evelyn's diary for 1685.

The financial outlay involved gradually proved too much for the Apothecaries, and it was proposed early in the eighteenth century to abandon the garden. Their troubles, however, came to the ear of Sir Hans Sloane, who had purchased the manor of Chelsea from Lord Cadogan in 1712 and was president of both the College of Physicians and the Royal Society. He now generously conveyed the freehold of the garden to the Apothecaries for £5 per annum, to maintain for the manifestation of the power, wisdom and glory of God in the works of creation, and to show how useful plants can be distinguished from those that are hurtful. The condition was attached that if at any time it ceased to be kept up as a scientific garden, it must be offered to the Royal Society or the Royal College of Physicians under the same conditions.

Sir Hans brought Phillip Miller (later F.R.S.), the active and learned author of *The Gardener's Dictionary*, in as head gardener, and the Royal College of Physicians contributed £100 towards the new hot-houses to signify that the ancient breach between physician and apothecary was healed. Under this new régime the garden flourished exceedingly.

In 1732 Miller sent out as a gift to the newly founded colony of Georgia, at Sloane's suggestion, a packet of cotton seed, and from that packet has descended the greater part of the cotton supply of the modern world! Mignonette was introduced into England via the Chelsea garden twenty years later. In 1737 a marble statue of Sir Hans by Rysbrack was erected in the garden, where he still stands arrayed in the presidential robes of the college.

Soon after this, Linnaeus, the father of systematic botany, was induced by the fame of the Chelsea garden to visit England from Sweden, and later he sent his distinguished pupils Kalm and Fabricius on several occasions. The garden was subsequently laid out on the Linnaean system in his honour.

In 1772, Sir Joseph Banks, P.R.S., a generous benefactor of the garden, returned from his exploration of Iceland and presented a rockery for alpine plants of which the actual rocks were blocks of lava brought by him from Mount Hecla, and supplemented by 40 tons of stones from the older Tower of London which had recently been demolished. This can still be seen surrounding the basin in the middle of the garden. On his return from his voyage with Captain Cook he also presented a large bag of seeds from Botany Bay.

About this time the Princess Dowager was forming her garden at Kew, and many rare trees and plants from Chelsea were presented through Sir Joseph Hooker. Miller was succeeded as head gardener by William Forsyth, after whom the shrub *forsythia* is named, and later by Curtis, the founder of the *Botanical Magazine*. In 1815 Thomas Wheeler was appointed curator and he personally conducted summer botanising excursions

\* From an address delivered in the garden on June 3 at a joint meeting of fellows of the Royal College of Physicians and members of the Society of Apothecaries—believed to be the first meeting of its kind for 168 years.

followed by a dinner at the Apothecaries' Hall. These were attended by many fellows of the College of Physicians as well as botanists. Ten years later other educational facilities were added, the garden being thrown open to all students of medicine, a professorship of botany being established, and an annual gold and silver medal being awarded to students. Among the recipients of these are the names of T. H. Huxley; William Jenner, Charlton Bastian, and Hilton Fagge. In 1835 John Lindley became professor. He was the author of the great work *Introduction to the Natural System of Botany* which led to the decline of the "artificial" system of Linnæus, and the garden was again laid out on his system.

In 1848 the then curator, Robert Fortune, was sent to the East India Company at their request, to attempt the importation into India of the tea plant; a venture which, as we know, was ultimately highly successful. This was accomplished by the use of the "Wardian" case, which was invented by Nathaniel Ward, F.R.S., a master of the Apothecaries' Society and originally a practitioner in the East End of London. By this means the cinchona tree was also brought from the New to the Old World, and so quinine was given to India, and bananas were brought to Fiji from China. One of his original cases still houses rare ferns in the Physic Garden.

1874 was a critical year, for the Chelsea Embankment was opened. This proved fatal to many of the rare trees and plants owing to the cessation of the tidal influx to their roots. Of the many interesting trees which survived, however, the maidenhair tree, which Sir A. Seward terms a "living fossil," may be mentioned, as also the two ancient mulberry trees which may owe their origin to James I's peremptory orders in 1610 to plant these trees all over England for their silk culture. A cork tree—essential appendage to the apothecary's bottle of medicine—also stands near the Stove house, as does a tamarisk tree, familiar to all who have served in desert countries.

#### OUR OWN TIMES

Towards the end of the last century the work of the garden was carried on with diminishing zeal. London had become too large for botanising expeditions, finances had dwindled, and botany was no longer so important a part of medical training. The Apothecaries finally threw in their hand, offering the garden both to the Royal Society and to the Royal College of Physicians, both of whom declined to accept responsibility. In 1893, however, the Charity Commissioners generously accepted responsibility to prevent it being built over, and it has since 1899 been financed for the benefit of scientific botany principally by the London Parochial Charities through a committee consisting of their representatives, together with those of the other interested bodies including the Royal College of Physicians and the Society of Apothecaries. Lord Cadogan also sits on this committee as the lineal descendant of Sir Hans Sloane.

The garden, which was laid out on the present Bentham-Hooker system in 1902, now employs a curator and eight gardeners, and over 3000 students and others are admitted annually. Botanical specimens are provided for many examining bodies, and seeds are exchanged with similar institutions all over the world. Much research work on plant physiology is carried out in the laboratories which adjoin the curator's house, while Chadwick and other lectures are given annually in the garden or lecture-room.

It is pleasing to find this quiet backwater of science continuing to serve the useful purpose for which it was founded more than three centuries ago, and it is to be hoped that it can be assured of the continued interest and support upon which its further survival depends.

"... Scientific imagination and insight do not automatically result when the mind is swept clean of preconceived notions and prejudices; their attainment is a positive achievement and not a merely negative one. And because this is true, scientists can and do pass ethical judgment on human behaviour; those things which are based on the scientific attitude, or encourage it, are good, those which stultify or deny it are to that extent bad."—Prof. C. H. WADDINGTON, F.R.S., in *The Scientific Attitude*, 1948.

## Disabilities

### 6. THE DEAF CHILD

DEAFNESS from birth, or acquired in early childhood, must be one of the most misunderstood disabilities. Because the deaf child shows no visible physical abnormality there is a general impression that he is stupid because he does not speak; people say he is "happy in his own little way" and seem to think he has been given some supernatural power which compensates for his lack of hearing and consequent inability to speak.

The parents of a deaf child require many qualities to combat the endless trials which infantile deafness imposes. We all know the mental irritation arising from acquired deafness in later life—and even then most of us are unsympathetic towards the sufferers—but we cannot comprehend the sufferings of the child who cannot acquire speech quickly and naturally, a prisoner in his own mind, unable to express the simplest thoughts. We need courage to face an unknown series of difficulties; self-control to overcome our pity and fear; a sense of justice to give the child a standard of values; patience to teach him the everyday things which hearing children learn automatically; and a sense of humour to keep the whole normal and undramatic. These qualities must also be fostered in the child, for he needs them all in double measure.

\* \* \*

When our family doctor first suggested that our two-year-old daughter might be deaf, neither he nor the specialist who confirmed his diagnosis had any idea what should be done.

Our baby was born at the beginning of the "blitz," and though full-term she was exceptionally small and was badly cyanosed forty-eight hours after birth. She was a poor feeder and gained weight very slowly. As a result she was spoiled and pampered, the more so as we spent half our lives in an air-raid shelter. The fact that she did not speak at the usual age (except to say "damn!" once at the appropriate time when she was just two) did not seem surprising in view of her continued delicacy. One felt that all physical development might be retarded; she had no teeth until she was thirteen months. When she was older she was very disobedient, but at meals or bath-time she responded with the correct actions to "drink your milk," "fetch the soap," and similar orders. Her movements were well coordinated, and she had an exceptional sense of balance; so it was fortunate for her that our doctor, who saw her through many illnesses, knew more of normal development than we did, and told us that she might be deaf.

I now realise that we were exceptionally lucky in immediately being recommended to consult, rather vaguely, "the Ewings of Manchester." To us the position and qualifications of these world-famous educators of the deaf were undefined, but here it seemed was a life-line. The doctors could do or say nothing to help us; they only knew that our child was severely deaf and, short of a miracle, would always remain so. They could not even tell us with certainty what was lacking to make her hear. They said she would never speak unless specially taught, and their eyes told us they were witness to a tragedy they could do nothing to alleviate.

Various forms of necromancy were suggested by kind friends, and we became tired of explaining that we believed the otologist's diagnosis and prognosis and did not wish to waste time experimenting. I am still explaining this after four years; but one continues to hear stories of magical surgical or manipulative cures for congenital deafness. Though never confirmed, these stories arouse false hopes in the minds of distracted parents, and send them off in futile search for escape from this heartbreaking disability.

While we waited three months for our turn to visit the Ewings at the department for the education of the deaf at Manchester University, we asked every conceivable individual, society, and authority for information as to how to help our child. The only results were the receipt of a handbook on lip-reading for the deafened, and another in which all relevant information was five years out of date. When we saw the Ewings the picture changed. They assured us that with proper training in speech and lip-reading our little girl could learn enough to take a fairly normal place in the world. This they demonstrated by having her attend their own day school for three weeks, and by introducing us to one of their former pupils whose speech is delightful and whose lip-reading is excellent. We were also given practical advice on how to manage and help a deaf child, with emphasis on the necessity for implicit obedience; this is essential for successful teaching and the avoidance of the many dangers of childhood. Beating was forbidden, but when at the age of three my child ran across a busy road, I dropped the shopping baskets, caught her, and beat her hard. She has never since crossed a road without permission.

Fearful tempers, screaming and kicking fits, wet beds, and sleepless nights may be the breath of life to psychiatrists, but not when the child cannot hear their sane arguments or soothing suggestions, nor understand the efforts of her family to give her suitable distraction. It is more likely that the parent might benefit from the psychological balm.

A highly strung delicate child is never easy to manage, especially in war-time London, and still less so when she is intelligent enough to realise that for some reason people either pity or avoid her. In some cases it may be possible to concentrate on the deaf child, but there is also a definite duty towards one's other children, who must not be allowed to feel left out because they are not deaf. We had been warned of this by a friend who felt that her childhood happiness had been sacrificed to that of her deaf sister. At the age of four our own younger child suddenly ceased to answer when she was spoken to, and when I asked her what was the matter she told me that she was deaf; but the suggestion that she should go to school with her hearing friends cured her deafness at once. This has been our only serious encounter with her fear of being neglected in favour of her sister.

The essence of success in the teaching of speech and lip-reading lies in beginning training at the earliest possible moment. Parents can now obtain a few pamphlets, and attend lectures and demonstrations in London; but when we were first faced with all the problems which are inherent in congenital deafness no such help was to be got. In common with many other parents, we found ourselves fighting our own distress and our child's disability in complete ignorance of the simplest outlines of education.

We were advised to seek private tuition for our child, with attendance at a day school for the deaf as second choice. At that time no schools were available in London, but now at last, after four years' very interrupted private tuition, the child is happily settled in a day school. This seems to be the ideal solution. Expert tuition at school, and at home the normal atmosphere and attitude towards life of hearing people.

The realisation of being "different" came to our little girl just before she was seven; her reaction was one of rebellion against everything and everybody, demonstrated by fits of rage and screaming with little or no provocation. After six months she feels better about it, but she is always very sensitive to a hostile or uncomprehending atmosphere. Her younger sister is a very patient kindly interpreter, and her hearing friends do their best to include her in all their activities and interests. She makes tremendous efforts to lip-read and

speak, often with great success, though when she is ill or tired the results are not good. Her school gives her confidence by showing her that she is not alone in her difficulties but that there are others with a similar disability.

We try to make her the object not of pity but of intelligent understanding. She has normal mentality, so no allowances are made beyond giving her a reasonable opportunity of understanding what is required of her. The concept of abnormality is never allowed, and long ago she learned the standards demanded. Independence and self-reliance have always been expected, and the knowledge that we assume her competence in dressing and undressing, bathing, meeting new people, laying a table, and in general helping with all that we do has given her an assurance which many hearing people might envy. Success is always rewarded with praise, and failure with clearly expressed disapproval.

The endless frustration of thwarted speech makes her restless and easily upset. The silence in her own world makes her unaware of the volume of sound she produces, and she hates to be alone. The reassurance brought by familiar sounds to the hearing child is lacking, and only sight can compensate for the deficiency. Hence at night she always has her bedroom door open, through which she can see the light shining in the passage.

Out of school she mixes as much as possible with hearing children, joining them in organised games, dancing, and drill, and above all taking part with them on equal terms in daily routine and free play. Other children are sometimes unkind, but not as often as grown-ups, who either over-sympathise or draw their own children away as from a leper. It is too often necessary to explain to these parents that deafness is not a bar to normal behaviour, and that their children do not regard it as such unless they themselves adopt the attitude that a deaf child's disability implies mental and moral inferiority.

\* \* \*

In 1943 it seemed that North America might well be far in advance of Great Britain in the testing and training of the congenitally deaf. Inquiry of the Volta Bureau, of Washington, D.C., elicited the opinion that this is not so. Last year personal inquiry of the Montreal and Vancouver Schools for the Deaf produced the information that they, and many American schools, are in some ways behind Britain in educational methods and laws, although a good deal of interesting work is being done on surgical intervention in nerve deafness.

The following year, inspired by the excellent monthly magazine sent to us by the Volta Bureau, a number of parents in Britain founded the Deaf Children's Society to help themselves and each other by passing on what little useful literature was obtainable and providing information and advice on schools, clinics, &c. It also tries to get more official notice taken of their children's requirements and to interest an apathetic public in the difficulties and need for human understanding of those born deaf. When it was founded in 1944 there was pitifully little to be given in the way of advice or help, but since the war ended several nursery schools and a unit for the partially deaf have been opened in London. New clinics have also been started in connexion with London hospitals, and other parents have banded themselves together in the Provinces to urge similar innovations.

Our difficulties are unlikely to be efficiently dealt with by civil servants, and we parents need far more help and guidance from those bodies who are qualified to advise and aid us in our efforts to better the educational provision for children who must pass their lives in a world where their eyes must do duty for their ears—where, in the words of a courageous born-deaf woman, "I do not feel shut out, because there is no sound in a sunset, only a perfect range of colour."

## In England Now

### A Running Commentary by Peripatetic Correspondents

THE Salpêtrière, with its spacious green courtyards, its relics of Charcot, and its other historic associations, formed an admirable setting for those of the neurological section of the R.S.M. and the Société de Neurologie de Paris on May 27. Nobody could have been more generous than our French hosts and the lavishness of their entertainment was almost overwhelming to the gastronomically unpractised.

At the banquet the president of the French society met unexpected competition from the broadcasting system. The strange tones in which he seemed to address us were not his own but those of an intruding performer on Radio Paris. The president shouted his welcome to the ladies at the top of his voice, whereupon the loudspeaker lapsed into dance music before being finally controlled. One could not but admire the brief but heroic efforts in the French language made by the British neurologists. "Je ne peux pas continuer" ruefully explained one distinguished neurosurgeon, after an impressive opening, but the fragmentary French was rightly appreciated. Our hosts ventured no English on the platform but they did their best to make things easy for us between the meetings—even, in one instance, offering some seats for "Mrs. Butterfly."

Paris is an escapist atmosphere and contrives to remain superficially gay. Expensive pleasures are to be had but you will see no milk or butter, and bread and coffee are inferior and scarce. Private cars using black-market petrol seem to abound, but the Metro is almost the only remaining form of public transport. The employees are very helpful. An absent-minded neurologist who had temporarily mislaid his Metro ticket turned out all his pockets and found a Bal Tabarin cloak-room ticket, which the inspector obligingly clipped. I'm afraid they don't take their controls seriously.

Years ago my old friend Smith, a surgeon to one of the big London hospitals, was a skilful amateur carpenter. So he was delighted to find that one of the patients in his wards was an expert in repairing antique furniture. Smith had many long talks with this man about his work, and one day the man remarked that his last job before coming into hospital had been to put a new leg on a Queen Anne armchair. It was a piece which if perfect would fetch a big sum but with one leg new was not worth much. He told Smith the shop where it could probably still be seen, described the chair very clearly, and told him how he could spot the new leg by a secret mark which he always put on his work. He begged Smith to keep this an absolute secret, because it was from this firm that he got most of his work, and it would ruin him if they knew he had given the show away.

The same evening, as he had to pass the shop on his way home, Smith called in saying that he wanted to have a look round. It was not long before he found the armchair and there, sure enough, was the secret mark on one leg. The dealer, seeing that Smith was interested in the chair, began to point out its merits, particularly that it was an original untouched piece. Asked the price, he named a very high figure. Smith pretended to look it over again, more carefully, and then, his boyish desire to appear clever getting the better of his prudence, he pointed to the marked leg and said, "Yes, it's a fine piece, but that leg wasn't there in Queen Anne's time." The dealer flushed momentarily, gave a slight cough, and said, "You are quite right, Sir, and I bow to you. It was not." He then added, "I can only tell you that there are not many experts in London today who would have spotted it."

The position was now awkward. Smith knew little about antique furniture in general or the Queen Anne period in particular; and at any moment the dealer might ask a question which would reveal his ignorance. However, being an eminent surgeon, Smith was accustomed to facing emergencies; so pulling out his watch and muttering something about an overdue appointment, he made for the door. The dealer, following him, said, "Before you go, Sir, may I ask your name and address?" Though caution whispered "No, no," Smith could not

with decency decline, and he was glad to get away even at that price. He stepped out into the street with a sigh of relief.

Time passed and he had almost forgotten the incident when, playing bridge with a few colleagues one evening, he was called urgently to the telephone. As he went out of the door there was a chorus of "Another country call, lucky man." But it turned out to be the furniture dealer, who said: "I want to ask a great favour. There is to be a sale of some exceptionally fine Queen Anne stuff at Reading tomorrow; I have been down and seen it, but I cannot make up my mind if it is genuine. Will you come with me in the morning, and give me your opinion?" Poor Smith could only mutter something about a consultation which would take him all day. Then he came back to his party and told them the whole story.

Here is this week's thrilling instalment of our gripping serial, *The Vengeance of Histolytica*:

The Chief Amoeba brought his pseudopodium down on the table with a splash, while the Amærobes held their breath. "I encyst!" he thundered.

After some years in the Navy and a year's house-jobs I have come out to one of the Dominions as M.O. to a cottage hospital. Last Sunday morning while I was enjoying a well-earned rest I was called out to an obstructed labour in a sheep. I had never even touched a sheep before, let alone applied the accumulated knowledge of three thousand years of medical science to one. But I went along to an outhouse where I found the farmer with a sheep having very obvious second-stage pains, bearing down in great style. The external os was prolapsed right through the vaginal orifice but was not dilated. The farmer said the sheep was very low, and I believed him. I pushed the uterus up, but when I removed my hand it immediately prolapsed again. As the cervix appeared to be unable to dilate in this position I did a manual dilatation and put my hand into the uterus, where I felt two face presentations (all lambs must be faces or breeches), one of which nibbled my examining finger. There was now plenty of room to work in, so I ruptured the membranes and did manual extraction of twins (incidentally, the liquor is much thicker in the sheep than in the human).

I did not do a manual removal of placenta because asepsis under these conditions was far from complete, and since a sheep's uterus does not feel like a human one I could not be sure if I was tearing the uterine wall. Bleeding was very free and the uterus did not contract, so I gave 1 ml. of ergometrine. I left mother happily licking her offspring, but when I went back that night I found an acute inversion of the uterus.

Not the least of the lessons I learnt in this case was the truth of the obstetrical teaching—which I had never until now contravened—concerning the danger of giving ergot before the uterus is empty. I should like to see one of our senior veterinary obstetricians handling such a case, and would especially like to watch him do an abdominal examination on a sheep—my attempt was a miserable failure.

He had been a most regular blood-donor and was remembered for the breathless haste with which he always arrived, usually well towards the end of a bleeding-session. One could picture his puny form expanding to gargantuan greatness as, in reply to an intimation that he was Rh-negative, he wrote, "I wish to acknowledge receipt of your letter of 29th ultimo, also the enclosed certificate of new Blood Group. The latter I am pleased to possess as I have been a vegetarian for over twenty years. Perhaps that explains why my blood belongs to a rare group." "*Of Man's first disobedience, and the fruit . . .*" Milton, Fisher, Race, Wiener and others please note.

A radiologist applied for a hospital appointment. He was informed by letter that his application had been unsuccessful. On the outside of the envelope were the words: A DISTINGUISHED CAREER—NURSING.



## Letters to the Editor

## REPRESENTATION OF SPECIALISTS

SIR,—The British Medical Association wishes to be the guide and helper of consultants and specialists, and to determine their policy on major questions. B.M.A. policy not long ago was to oppose State ownership of hospitals. It was on that point that, in my own division, the bitterest though fortunately briefest conflict of the whole National Health Service controversy arose; but who can offer a practicable alternative now? When I remember this unnecessary conflict, and the irritation of specialists who found their terms of service for public authorities revised and lowered by the B.M.A. without their knowledge, and further that it was necessary to create an entirely new organisation (outside the B.M.A. altogether) to represent the staffs of provincial hospitals, it seems to me that the B.M.A. has little to offer except its secretariat. When I review the figures it suggests for regional committees I cannot believe, though I am a member of provincial hospital staffs, that it is wise to have only 2-5 members of teaching hospital staffs out of a total of 19-30. It is around the teaching hospitals that provincial hospitals are orientated, and to put their representatives on committees where they may be outvoted by part-time provincial consultants is not justifiable.

Decisions in hospital and consultant service are not like those made by local medical and panel committees. General-practitioner standards are set at the periphery: in big cities general practice is often less satisfactory than in less densely populated areas. In consulting work, on the other hand, where standards are hospital standards, the opposite is the case: the big centres have the big and good hospitals. Representative machinery which serves general practice therefore cannot serve specialism, which works the other way round. It is to teaching hospitals that we provincial consultants go to see new methods and organisations. If we follow our professional consciences we must admit that only through teaching-hospital guidance can we improve as we wish. Such guidance cannot be given through committees as heavily loaded at the periphery as the B.M.A. proposes.

The application of politico-medical machinery to determination of standards is still more inappropriate. The B.M.A. considers that the Central Consultants and Specialists Committee should act by majority representation; but it is the teaching hospitals that generally set the standards, and when the teaching hospitals have only 10-15% regional representation they cannot be adequately represented on this central committee, especially with representatives liable to be instructed by a predominantly provincial body in a sense with which they may not agree. Nor will rearrangement of university hospitals facilitate things for them in their new and often strange regions.

Again, in the B.M.A. scheme, although specialists like anaesthetists and radiologists have special representation, no physician, surgeon, obstetrician, or gynaecologist is elected as such. The regions cannot be expected to arrange among themselves representatives for each of these important general specialties, nor can the latter be expected to approve the loss of their freedom to choose their own representatives.

This point has gained importance since the issue of the Spens report. Whether the report is accepted or not, some grading of income is likely; and that this should be determined through the B.M.A. is most undesirable. Although in Scotland the B.M.A. proposes that four members of its Central Consultants and Specialists Committee should be appointed by the Royal Corporations, in England and Wales no representation from the Royal Colleges is suggested—despite the fact that 10 members reach the central committee through the representative body, council, and various committees of the B.M.A., in addition to the officers of the association.

It appears, in fact, that the B.M.A. plan for consultants restricts the influence of the great teaching schools very much indeed, and eliminates that of the colleges. Consultants will no doubt weigh the advantages of the B.M.A. secretariat against the disadvantages of this general policy.

Hove, Sussex.

W. A. BOURNE.

## REGIONAL ILEITIS

SIR,—Your leading article of May 29 suggested a relationship between regional ileitis and ulcerative colitis. In this connexion the following observations may be of interest.

Three months ago I saw a patient with proven Crohn's disease who had had a resection four years previously at another hospital. On and off before operation, and continuously since then, she had had symptoms of colitis. There was no steatorrhœa; the fœces contained some pus cells and much mucus. Sigmoidoscopy revealed mild proctocolitis. A careful life history, with descriptions of personal relationships and reactions to various stress situations, showed the patient's personality to be similar to that found in idiopathic colitis and proctitis.<sup>1</sup>

I have since interviewed a further three patients with regional ileitis. "Skip" lesions or colitis had not overtaken them. They all displayed the abnormal dependence which is a factor common to duodenal ulcer<sup>2</sup> and colitis, and for the same reasons of excessive attention by one parent or complete lack of affection in childhood. In all cases onset and relapses were related to stress situations. The compensatory striving and perfectionism seen in duodenal-ulcer patients is notably absent in colitis, and is replaced by smugness, deep narcissism, even greater dependence, and lack of aggression.

It is too early to be definite, but the last three cases of Crohn's disease appear to fall psychologically, as well as anatomically, between duodenal ulcer and colitis. The high incidence amongst Jewish people has already been noted by Bockus,<sup>3</sup> and my experience supports this for colitis as well as Crohn's disease. The paramount position of the mother and frequent interdependence of members of a Jewish family provide a fertile soil. It appears possible that colitis and Crohn's disease may represent variations in reaction to a similar form of chronic recurrent gut dysfunction. With Lium's<sup>4</sup> work in mind, I would suggest that this dysfunction is possibly spasm and its secondary effects. The discrepancies in pathology are not so great that they cannot be explained by the differences in structure, and particularly of lymphatic drainage, between the small and large intestine.

Middlesex Hospital, London, W.1.

J. W. PAULLEY.

## POSTURE IN SCHOOL-CHILDREN

SIR,—I was much interested in your annotation of May 29 on the report from the Research Board for the Correlation of Medical Science and Physical Education.

The appalling amount of faulty posture seen today among our school-children should be the subject of greater propaganda. Almost half the children of school age suffer from some type of preventable postural defect, and this high incidence provoked me last year to initiate at Birkenhead, in conjunction with the education authorities, an experimental scheme of incorporating specially selected remedial exercises within the normal physical-training (P.T.) curriculum for all schools.

The necessity for this was brought to light by analysis of the attendances at the town's orthopaedic clinics. Figures which speak for themselves revealed that each year there was an average of about 10,000 individual attendances at the remedial classes. Further inquiry revealed that each attendance necessitated a loss of 1½ hours' lesson time—i.e., the time taken by the pupil to leave school, have his exercises, and return (rather reluctantly) to school. As each pupil has to attend twice a week for about two school years—the average time taken to correct a postural error—the total loss of lesson time per pupil adds up to 250 hours. This is a subject of constant complaint by teachers and parents.

Since flat feet and round shoulders are by far the commonest defects, we have concentrated upon selected remedial exercises for these conditions. The proportion of time allocated to the exercises in each P.T. lesson is

1. Sullivan, A. J. *Yale J. Biol. Med.* 1932, 4, 779. Wittkower, E. *Brit. med. J.* 1938, ii, 1356. Groen, J. *Psychosom. Med.* 1947, 9, 151.
2. Ruesch, J., Harris, R. E., et al. *Chronic Disease and Psychological Invalidism.* New York, 1946. Kapp, F. T., Rosenbaum, M., Romano, J. *Amer. J. Psychiat.* 1947, 103, 700.
3. Bockus, H. L. *Gastroenterology.* Philadelphia, 1946; vol. ii, p. 162.
4. Lium, R., Porter, J. E. *Arch. intern. Med.* 1939, 63, 201.

still under discussion and must be modified by experience; but at present we are using 10 minutes of the normal 30 minutes' P.T. session.

To operate this scheme, it has been necessary to give lectures on general posture to the school-teachers, and to instruct them in the selected remedial exercises. We have found them most coöperative, for they realise the benefit of the non-interruption of the child's schooling. This has been coupled with talks and demonstrations to the parents, to point out the value to general health of continued good posture. Although the scheme has been in progress less than a year, it is already yielding most encouraging results.

HORACE DAVIES

Consultant orthopaedic surgeon,  
County Borough of Birkenhead.

### PULMONARY OEDEMA

SIR,—May I be allowed to bring another point of view on this fascinating problem, so well defined by Prof. G. R. Cameron?<sup>1</sup> If the patient calls you in early, if the doctor arrives promptly before the pink sputum appears in abundance, and if the previous reading of the systolic and diastolic blood-pressures are known—then, in my experience, the pressure will be found considerably raised. The systolic pressure may go up 30 mm. or 50 mm. Hg and the diastolic one correspondingly. It does not seem to me very easy to explain that by an oncoming heart-failure. It is probably the result of the angio-spasm in the pulmonary area—hence the prompt and life-saving effect of a liberal venesection. Moreover, I usually inject intravenously or intramuscularly a hypertonic solution of magnesium, and the patient is much better within a few hours. But I agree that heart-failure supervenes very quickly, and later it completely dominates the picture.

London, E.1.

N. PINES.

### MODE OF ACTION OF THE SULPHONAMIDE DERIVATIVES

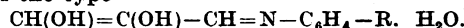
SIR,—Two recent publications<sup>2,3</sup> make desirable a brief account of our current investigations on the above subject, since the interpretation of the results obtained elsewhere is likely to be influenced by our findings.

O'Meara, McNally, and Nelson<sup>4</sup> first correlated the activity of the sulphonamides with the production of reductone by bacteria especially during the logarithmic phase of growth. They showed that *p*-(2:3-dihydroxy-2-ene-propylideneamino) benzoic acid (reductone-*p*-aminobenzoic acid) can be utilised by bacteria, whereas the corresponding sulphapyridine and sulphathiazole analogues cannot. They thus showed that the sulphonamides are lethal for bacteria because they condense with reductone, thereby depriving the cell of, this substance.

Forrest and Walker<sup>5</sup> suggest, on chemical grounds, that reductone-*p*-aminobenzoic acid is built into pteridines in normal bacterial metabolism, whereas in the presence of sulphonamides the analogous sulphonamido compounds are formed. We prefer to hold that reductone-*p*-aminobenzoic acid is the starting-point for many normal intracellular growth reactions, including (a) those yielding energy, (b) assimilation of carbon, (c) synthesis of purines,<sup>6</sup> and (d) synthesis of pteridines. It follows that all these reactions are blocked simultaneously by union of reductone with sulphonamides, and that the mode of action of the sulphonamides is to combine with reductone, as stated by O'Meara et al.<sup>3</sup> This view is much more in accord with the known lethal activity of the sulphonamides in the logarithmic phase of growth than is the attribution of their activity to inhibition of a single isolated function of the cell such as the synthesis of folic acid.

We have repeated the work of O'Meara et al.<sup>3</sup> and have investigated the products obtained when reductone, in crude solution, is condensed with *p*-aminobenzoic acid, sulphanilamide, sulphathiazole, sulphapyridine, sulpha-

mezathine, and *p,p'*-diaminodiphenyl sulphone. It is clear that these condensation products are monohydrated anils of the type



Our work confirms that of Angier et al.<sup>2</sup> in so far as the *p*-aminobenzoic acid derivative is concerned. Our conclusions are based on ultimate analysis and for reductone-*p*-aminobenzoic acid on colorimetric estimation of the *p*-aminobenzoic acid content, using Ehrlich's reagent, after hydrolysis with sodium hydroxide. It was also shown that the water of hydration could be removed at 100°C, or in a desiccator. Water is taken up again on standing in air. In view of the condensation of reductone-*p*-aminobenzoic acid with 2:4:5-triamino-6-hydroxypyrimidine by Forrest and Walker,<sup>3</sup> we wish to state that we have condensed reductone-*p*-aminobenzoic acid with urea.

A full account of our work will be published elsewhere.

One of us (E. A. B.) is in receipt of a grant from the Sarah Purser Medical Research Fund.

University Chemical Laboratory  
and School of Pathology,  
Trinity College, Dublin.

E. A. BELL  
WESLEY COCKER  
R. A. Q. O'MEARA.

### THE NURSE IN PREVENTIVE MEDICINE

SIR,—I should like to endorse the remarks of Dr. Booth in your issue of May 1, particularly in regard to diphtheria immunisation. It will be difficult to keep up the present immunisation-rate if the work is left to general practitioners, who will have little time for it. It should be remembered that diphtheria immunisation must be a continuous process in routine preventive medicine, and not dependent on immunisation campaigns; these intermittent periods of intense activity are often followed by periods when insufficient is done to keep pace with the number of births—the crucial number for any area.

I firmly believe that diphtheria immunisation should be done principally by medical auxiliaries such as health visitors, and not by medical practitioners. It is well known that people tend to do the work that is approaching the upper limit of their training or capabilities more conscientiously and with greater care than when it tends towards the lower limits. So with diphtheria immunisation: the nurse finds it interesting, and it adds to her importance, while the doctor finds it irksome and repetitive.

In 1942 in New Zealand I introduced a scheme for diphtheria immunisation, using district health nurses (health visitors) to cover a large, sparsely-populated area. The pre-school immunisation-rate was raised from 8% to 70% in eighteen months, which would not have been possible if general practitioners or clinics alone had been used. A high proportion of the injections was given in the homes during routine visits by nurses. I understand that a scheme of this type, employing district health nurses, has now been introduced to cover the whole country. The annual report for 1946 shows that of the 66,500 complete immunisations done in that year (New Zealand's population is 1,700,000), 24,000 were done by district health nurses in the six-month period April-September, suggesting that in a full year they do the major part of this work.

C. W. DIXON

Lecturer and Chief Assistant,  
Department of Preventive Medicine and Public Health,  
The University, Leeds.

### HIGHER QUALIFICATIONS

SIR.—Special diplomas are granted in almost all branches of medicine. Their significance appears to lessen with each successive advertisement; and it now seems that there is no other specialist qualification but the M.R.C.P. Within the last twelve months advertisers have stipulated only a higher medical qualification when filling posts requiring special knowledge of (1) administrative work, (2) industrial medicine, and (3) child health. I submit that the requirement is really a D.P.H., D.I.H., D.C.H., or whatever is the appropriate diploma: then might be added "and preferably a higher medical qualification." At the present rate no-one at all will be able to practise anything without an M.R.C.P.

BURMA STAR.

1. See *Lancet*, May 1, p. 680. The lecture appears in full in the *British Medical Journal* of May 22.

2. Angier et al. *J. Amer. chem. Soc.* 1948, **70**, 25.

3. Forrest, H. S., Walker, J. *Nature, Lond.* 1948, **161**, 721.

4. O'Meara, R. A. Q., McNally, P. A., Nelson, H. G. *Ibid.*, 1944, **154**, 796; *Lancet*, 1947, **ii**, 747.

5. Shive et al. *J. Amer. chem. Soc.* 1947, **69**, 725.

## COMBINED CHAULMOGRATE AND SULPHONE TREATMENT OF LEPROSY AND TUBERCULOSIS

SIR.—May I draw attention to a preliminary report by G. E. Slotkin<sup>1</sup> on "A new and rapid method for the control of urinary tuberculosis." This furnishes remarkable confirmation of the value of the suggestion I made in your issue of April 3—to treat the diseases caused by acid-fast bacilli, leprosy and tuberculosis, with a combination of chaulmoogrates or morrhuates, to produce focal reactions with breaking up of the causative bacilli, and either sulphones or streptomycin to destroy any remaining bacilli which may enter the circulation.

Slotkin first demonstrated that the exposure *in vitro* of the acid-fast bacillus, *Mycobacterium phlei*, to the action of high dilutions of chaulmoogra oil for a few hours rendered it far more susceptible to destruction by streptomycin. He then treated six consecutive cases of T.B.-positive inoperable or double renal tuberculosis with daily intramuscular injections of 1–2 ml. of chaulmoogra oil or of its ethyl ester in the form of 'Moogrol' (B. W. CO.), for 7 days; followed by the same drug in combination with streptomycin daily up to a total of 30 days. In all cases the symptoms cleared up, with healing of tuberculous ulcers in the bladder in some of them; and the tubercle bacilli, which previously could be demonstrated in smears from the urine, disappeared and could not be demonstrated even by animal inoculation. He therefore advocates the treatment of all forms of tuberculosis by this combination of remedies. They are likely to be even more effective in leprosy because of the greater vascularity of its lesions, as I suggested. In that case a material reduction in leprosy incidence will be much facilitated.

London.

LEONARD ROGERS.

## SICKLING RAPIDLY DETECTED

SIR.—Your annotation last week deserves attention since erythrocyte sickling may be associated with most bizarre syndromes, and if the sickling trait be undetected major diagnostic errors may be made. Furthermore, recent observations suggest that 12% or more of negroes as well as many individuals of negroid stock possess this dominant mendelian trait, and it has been demonstrated more rarely in white persons and others of non-negroid ancestry.

In the orthodox tests, using 'Vaseline'-sealed cover-glass preparations of blood or paraffin-layered tubes of citrated blood, 48 or more hours' observation may be required before the sickling is apparent, while in the venous-stasis method slow sickling or reoxygenation of the blood may cause errors in interpretation, although the effects of reoxygenation may be diminished by pricking the congested anoxic finger through a drop of formalin, thus fixing the cells as they are shed. The more recently described rapid methods, based on the findings of Neuda and Rosen,<sup>2</sup> are therefore of value. It may be objected that they require cultures of suitable organisms, but such cultures may be obtained by incubating overnight in broth a roughly filtered saline extract of faeces.

The production of sickling by oxygen-consuming bacteria suggested another method of demonstrating the trait; and it was recently possible to test this method at the Hospital for Tropical Diseases, London, with a patient who happened to possess the sickling trait. Trypanosomes by their great activity utilise large quantities of oxygen, and over 35 years ago Nauss and Yorke<sup>3</sup> showed that the incubation, in the absence of air, of living trypanosomes in defibrinated blood causes, if the parasites be numerous, complete reduction of the hæmoglobin. It seemed of interest therefore to examine the effect of trypanosomes in producing sickling, although it is not suggested it would form the basis of a practical test for sickleæmia.

Having made a rich suspension of trypanosomes free of red cells by centrifugation of citrated blood from a rat heavily infected with *Trypanosoma rhodesiense*, I placed a small drop of the suspension on a slide. A drop of the patient's blood from a prick in the finger was taken on a cover-slip, which was then placed on the slide so that the blood and the

trypanosome suspension mingled. The preparation was sealed with vaseline, and within a few minutes at 37°C sickling commenced and was soon complete. A comparative preparation, in which a drop of a fresh broth culture of faeces was used instead of the trypanosome suspension, showed only an occasional cell sickled after 15 minutes, and sickling was not complete until after some hours. In the ordinary vaseline-sealed cover-glass preparation of the patient's blood alone, sickling did not become apparent until almost 24 hours had elapsed.

London, W.1.

F. MURGATROYD.

## THORACIC SURGICAL SERVICE

SIR.—Your annotation of May 22 is timely, but your opening sentence casts a shadow which must be dispersed before it deepens. You say: "The organisation of hospitals in regions promises benefit to the rarer and more complex specialties." The inference is inevitable that thoracic surgery is still considered as something unusual and apart from surgery as a whole.

The terms "general surgery" and "special departments" are relics of a past era, and it is important that at the present time, when the practice of medicine and surgery is being reorganised throughout the country, our views should be brought up to date. The term "general surgery" survives from the days when it was possible for one man to comprehend and practise the whole ambit of surgery: it was useful in distinguishing such a man from his colleague practising the special surgery of the eye or the ear, nose, and throat. But the further analysis of surgery into special branches has led to such advances that it is no longer possible for a man to be a "general" surgeon in the original comprehensive sense of the word. I suggest, therefore, that it is more in keeping with modern practice to use the terms "sectional" and "systemic" surgery. Abdominal, thoracic, and pelvic surgery are sectional; and the surgeon practising within a section would investigate and treat disease affecting any organ within that section. Orthopaedic surgery has become so extensive that it must be considered as sectional, and the pelvic surgeon would, by usage, be the obstetrician. Ophthalmic, aural, and urogenital surgery, and neurosurgery, being confined to a particular system, may be called systemic. Surgery is not static and further systemic developments will occur within sections. Some systemic branches which have become standardised may be returned to the pool of sectional surgery. Regional surgery might have been a better term than sectional, but with the country divided into regions for administrative purposes it might lead to misunderstanding.

In all teaching hospitals there must be those, many of whom may be professors, who have a theoretical knowledge of the whole subject and whose purpose will be to synthesise, correlate, and teach it; but the majority of surgeons will never in the future be able to practise surgery at a level comparable with that attained in the systemic departments. When we consider the organisation of the teaching hospital we must realise that it is possible, in any section, to teach students the principles of surgery, to demonstrate physical signs, and to illustrate pathological processes; and there is no special merit in teaching them the details of one section to the exclusion of another. It is no more necessary for the undergraduate to know how to remove a lung than a gallbladder. He must be taught not so much the details of abdominal or thoracic surgery as the physiology, pathology, and clinical medicine which these subjects have to show him. There is, therefore, no justification for the segregation in the future of small blocks of 15 to 20 beds for undergraduate teaching of sectional thoracic surgery.

We must also take note of the fact that the importance to patient, doctor, and student of any one branch of sectional surgery varies from time to time; it waxes and wanes as new treatments appear and as tried ideas become obsolete. The field of thoracic surgery, ranging as it does from the neck to the abdomen, has now been so far developed that thoracotomy is as safe as laparotomy; and experience shows that the actual number of patients who require investigation or treatment for thoracic abnormalities is very large. The open chest has provided a huge field for exploration, the scope of which

1. J. Urol. 1947, 58, 464 (reprinted in *Int. J. Lepr.* 1948, 46, 29).  
2. Neuda, P. M., Rosen, M. S. *J. Lab. clin. Med.* 1945, 30, 456.  
3. Nauss, R. W., Yorke, W. *Ann. trop. Med. Parasit.* 1911, 5, 199.

is stimulating further analysis. Surgeons are beginning to concentrate on cardiovascular, pulmonary, and oesophageal surgery in the same way that urogenital surgery has been studied in the past.

All teaching hospitals should include a large outpatient department and 100-120 beds for the various branches of thoracic surgery; and of these at least 30 should count for the surgery of pulmonary tuberculosis. This number should not be static or rigid, but should vary with the knowledge and requirements of the day.

Leeds.

P. R. ALLISON.

### PLANTAR WARTS

SIR,—I have followed with interest the lengthy correspondence on the treatment of plantar warts. Having encountered many cases which have not responded and/or have relapsed after the application of one or more methods of treatment, I can strongly commend the following procedure which has proved completely effective in my hands, and is economical and very simple. According to the lesion's size 5-10 minims of 5% aqueous solution of phenol is injected, via normal skin, into the centre of the base of the wart. Relief from pain is immediate; the patient can walk out of the consulting-room, and in 3-6 weeks, without further symptoms, the wart disappears.

My colleague, Dr. P. Inman, at the Royal Infirmary, Sunderland, has adopted this method, and he has obtained similar results to my own.

W. GILLIES ANNAN

Darlington.

Medical referee (dermatologist), co. Durham and North Yorks.

### PERINEPHRIC INFLAMMATION TREATED WITH PENICILLIN

SIR,—In your issue of April 17 Mr. Lauste, commenting on my letter of March 20, stated: "While it is reasonable to suppose that penicillin may cure a perinephric infection in the early stages, often the condition is not then suspected." In my previously reported case it was considered that the patient suffered from an infection of the perinephric tissue, which was clearly described; it was the 10th day of the illness. It was supposed that penicillin might cure the infection and it did so. I wish to repeat these facts as a reply to Mr. Lauste's comment. I should add that the title of my letter, which originally had the heading "perinephric inflammation treated with penicillin" was changed by the editor of THE LANCET to "perinephric abscess treated with penicillin," presumably because the letter also referred to two other articles on this subject entitled "perinephric abscess" &c.

London, S.W.6.

F. KRONENBERGER.

### THE CHILD WITH BAD SIGHT

SIR,—Your editorial comment (May 8) did a service in calling attention to Mrs. Philippa Martin's views on the child with bad sight. There is no doubt that much child delinquency and mental backwardness can be traced to bad vision. Not every child who is maladjusted suffers from defective eyesight, but this is a more frequent cause than people realise.

I must confess to a feeling of bathos, when reading Mrs. Martin's views on the great importance of careful attention to the eyesight of children, to find that she finished by advocating that every child should be first "refracted" at the age of 7, and then at least twice more during the school career. Eye defects in children can be treated much more easily in the early stages, and the failing of the present school ophthalmic service is its inability to detect eye troubles before they become well established.

Surely the way to reduce the incidence of eye defects among school-children is, firstly to pay careful attention to the eyes of infants attending welfare centres, and then to give a full ophthalmic examination when the child starts school at the age of 5, and to follow this by yearly ophthalmic inspections, using objective methods, until the age of about 11 when inspections every 2 years would be adequate. A colour-vision test at the age of 13 is advisable.

Association of Optical Practitioners,  
Brook Street, London, W.1.

S. BLACK.

### INFECTIONS OF THE HAND

SIR,—I submit that Professor Pilcher's interesting thesis (May 22) that rest is desirable in the treatment of inflammation should not be interpreted, by those using the "conservative treatment" in infections of the hand, as a licence to run amok. Surely the respective indications for incision and conservatism are as plain as they have always been?

Penicillin is the treatment of cellulitis caused by organisms sensitive to it; it is wrong, and always has been, to incise for a cellulitis; but an abscess has no circulation, and no systemic drug can reach its contents. There is no such thing as conservative treatment of a pyogenic abscess, in the hand or anywhere else (except occasionally in certain abdominal conditions).

Many surgeons must by now have seen an abscess turned into an indolent mass, the walls of which have been sterilised by a penicillin-plugging house-surgeon; when the abscess is finally incised the rigidity of the cavity prevents its collapse, leaving a chronic sinus.

London, N.8.

J. R. GIBBS.

### ELECTRONARCOSIS

SIR,—The conclusions of Dr. Garmany and Dr. Early (March 20) are quite out of keeping with experience in New Zealand. Since October, 1945, I have treated over 70 schizophrenics with electronarcosis. I am not convinced that results in the acute and atypical schizophrenics are better than those obtained with convulsive therapy, but in paranoid schizophrenia very promising results are being achieved.

As to complications, apprehension was less prominent than with electroconvulsive treatment; and if it developed it was easily overcome by giving intramuscular 'Sodium amytal' before treatments. Although each of my patients received between 20 and 40 treatments, and individual treatments in a recent series were prolonged up to fifteen minutes or more, no instance of the type of circulatory collapse described by Garmany and Early was seen. In my experience electronarcosis is not a dangerous form of treatment, and it is to be hoped that the findings of Garmany and Early in so small a group of patients, with an average of less than ten treatments each, will not discourage further work.

Ashburn Hall, Dunedin,  
New Zealand.

R. W. MEDLICOTT.

### ALEUDRINE AND ANTHISAN IN BRONCHIAL SPASM

SIR,—Professor Dunlop and Dr. Hunter (May 29) object to my positive conclusions about the efficacy of 'Anthisan' (May 1) for two main reasons:

1. They say that the increase of vital capacity under anthisan is not large enough to be convincing.

My values are the means of three (sometimes two if very close together) measurements of subjects who were trained in the method. Although I have worked with this method for many years I cannot recollect a single instance where a patient in a mild or severe asthmatic state who was trained to produce consistent values (within a range of 150 c.cm.) increased his vital capacity by 400 c.cm. or even 300 c.cm. from one hour to another by his willpower or by strong suggestion from outside. I have, however, often seen this happen under the influence of adrenaline, 'Aleudrine,' aminophylline, ephedrine, anthisan, and other drugs. There is no need for "dummy" tablets with this method. If 0.2 g. is given one day and the vital capacity remains unchanged, and 0.4 g. is given the next day with an increase of 400 c.cm., I should think that this might be accepted as satisfactory. But usually the same patients were also given other substances which proved ineffective and thus provided controls. I believe, therefore, that increases of vital capacity of 300 c.cm. or more, although they may amount to no more than 10% of the whole, are significant. It is obvious from my results that an increase does not take place in all patients, and that it is smaller than with aleudrine: but there is an increase which cannot be ignored.

2. They think that tolerance does not develop at all because it does not develop in the treatment of urticaria.

The latter observation I can confirm from my own experience, and I have been surprised by the occurrence of tolerance in the treatment of bronchial spasm. This is one of the many problems presented by the anti-histamine drugs. They affect different organs at the same time, and it appears that tolerance develops to some effects and not to others. Ephedrine in optimal doses often causes palpitation on the first day only; when this disappears the antispasmodic effect still persists. The soporific effect of anthisan decreases quickly, whereas its beneficial effect on vasomotor rhinitis continues. There is no explanation for this curious phenomenon, but having observed some cases of acquired tolerance to anthisan in bronchial spasm, I submit that the fact that tolerance is not usual in urticaria is irrelevant.

To sum up: the negative results obtained by Hunter and Dunlop with anthisan are, I think, attributable to suboptimal dosage. This may easily happen with a new substance. I suggest we defer further judgment till our experience with this substance has grown.

London, W.C.1.

H. HERXHEIMER.

M.R.C. IN WAR

SIR,—It would be unfortunate if the readers of your issue of May 8 got the impression that all medical research is being paid for by the taxpayer, either directly by Government grants through the Medical Research Council or indirectly through other public funds disbursed by the local authorities. A fair amount of research of practical importance has been done and is still being done by doctors who, in addition to clinical work, have devoted their time and money to research. These clinicians are not paid by the M.R.C. and they do not receive any financial, secretarial, or clerical help from any source for research work or for publication.

Sutton, Surrey.

M. N. PAI.

TRANSFIXION

SIR,—Your articles on the transfixionist<sup>1</sup> recall to my memory a patient who came under my care some eight years ago.

He was a Zande of the southern Sudan who, while out hunting, had fallen on his spear. At the time I was touring in the area, and late one afternoon visited one of our dispensaries. There was a large crowd of people sitting about; and the dresser in charge told me they were friends of one who had a spear wound. It so happened that the senior assistant of the dispensary was away at the time. This dresser showed me the patient, who, with two small wounds neatly stitched up, was sitting in Fowler's position. The spear had entered the right side of the abdomen below the costal margin, and come out on the left side of the back just inside the apex of the scapula. Thus transfixion, the man had been carried to the dispensary. The dresser pushed the spear through a little further, removed the head, and then pulled out the shaft from the abdominal wound. The head was about 4 in. long and 1 1/2 in. wide at its widest point.

I took the patient to the nearest hospital, where he was treated. He had a large hemothorax, but apart from this appeared quite reasonably fit. He was most annoyed at having to stay in bed. Ten days later he quietly and silently left us one night, and with him took his hospital clothes and a blanket. We never saw him again.

Malakal, The Sudan.

J. F. E. BLOSS.

FUTURE OF GENERAL PRACTICE

SIR,—I am sure all general practitioners and many members of the public will be distressed to see the great difference in remuneration offered by the two Spens Committees to consultants and specialists on the one hand and to general practitioners on the other. Whereas, at 1939 values of money, the recommendations of the first committee were designed to give a net income of more than £2000 to only 9% of practitioners of 40-49 years of age, the new committee reckons that at the age of 40 or soon afterwards the specialist should be earning £2500, apart from any possible award for special distinction.

The Spens Committee on the remuneration of general practitioners made the following pointed remark: "We,

1. *Lancet*, 1947, ii, 523; April 10, p. 567; June 5, p. 891.

and not least our lay members, consider that it would be disastrous to the profession and to the public if general practice were recruited only from the less able young doctors." You may remember that in "General Practice Tomorrow" published in your issue of March 22, 1947, I said that "general practitioners are the shock troops of medicine—on whose skill, decision, and courage the whole service will stand or fall." Those remarks are as true today as they were then—if the new service is to be a success the finest not the lowest type of man must be attracted to general practice. You yourself said on Jan 4, 1947, that "to be a first-class G.P. is harder than to be a competent specialist," adding that "if men and women of high calibre are to be attracted into general practice, the incomes within their reach there should not be substantially lower than those of their coevals who decide to specialise."

Worthing.

HAROLD LEESON.

Public Health

Supplies of Inocula

ARRANGEMENTS for distribution of immunising agents, under section 26 of the National Health Service Act, are announced by the Ministry of Health in a circular (no. 79/48).

*Smallpox*.—Lymph for vaccination will be issued from a number of laboratories direct to the prospective users, whether medical officers of health or general practitioners.

*Diphtheria*.—Stocks of A.P.T. and T.A.F. will be held by medical officers of health or district medical officers, who will be able, as at present, to obtain free supplies from the Public Health Laboratory Service; they will be free to arrange for issues to general practitioners taking part in the immunisation service.

*Whooping-cough*.—Local health authorities will need to make their own arrangements for obtaining through commercial sources the prophylactic material.

*Other Diseases*.—Certain vaccines, sera, &c., not readily obtainable from trade sources, may be had through the Public Health Laboratory Service—e.g., measles serum, typhus vaccine, rabies vaccine, and botulinum antitoxin. A service of inoculation against yellow-fever, for persons travelling abroad, is operated at most regional blood-transfusion centres and at certain other centres; particulars are obtainable from the passport office, the main shipping companies, and the overseas airways corporations.

Notifications of Infectious Diseases

ENGLAND AND WALES

Disease	Week ended May				
	1	8	15	22	29
Cerebrospinal fever ..	57	46	36	48	40
Diphtheria .. ..	134	143	153	168	151
Dysentery .. ..	119	108	111	118	122
Encephalitis lethargica ..	..	..	2	1	2
Measles, excluding rubella ..	10,169	10,156	11,879	11,677	13,468
Ophthalmia neonatorum ..	62	59	46	57	56
Paratyphoid fever ..	3	5	7	8	5
Pneumonia, primary or influenzal ..	546	509	611	628	579
Polioencephalitis ..	..	3	2	2	1
Poliomyelitis .. ..	13	9	19	20	20
Puerperal pyrexia .. ..	112	99	101	105	92
Scarlet fever .. ..	1538	1578	1675	1354	1216
Smallpox .. ..	..	..	..	..	..
Typhoid fever .. ..	12	8	6	6	9
Whooping-cough .. ..	3684	3110	3117	2680	3085

## Parliament

### FROM THE PRESS GALLERY

#### Lords and the Death Penalty

THE House of Lords on June 1 and 2, on the committee stage of the Criminal Justice Bill, discussed Lord LLEWELLIN's amendment to delete the clause to suspend for five years the death penalty for murder. This clause was inserted by a free vote in the Commons against the advice of the Home Secretary, and afterwards accepted by the Cabinet. At the second reading of the Bill in the Lords<sup>1</sup> the clause was severely criticised.

Many things had happened since the Commons took their decision, Lord LLEWELLIN declared in moving his amendment, including an unusual number of murders. A further reason for sending back the clause to the Commons was that there could not be one law for those with white skins and a different law for those with coloured skins. There was bound to be pressure on the Secretary of State for the Colonies to make Colonial law conform to the British law, and this might increase the ritual and tribal feuds. Viscount SAMUEL, in suggesting that the death penalty might be limited to the gravest categories of murder, said that the overwhelming opinion of the nation was against the clause.

Lord OAKSEY insisted that the primary object of punishment was not reform but the protection of society and the satisfaction of its righteous indignation. He warned against gambling with the safety of the police and the public. The ARCHBISHOP OF CANTERBURY said that the saying "An eye for an eye, and a tooth for a tooth" had often been regarded as vengeful and vindictive. But in its origin it was a restraint on vengeance. In such matters the law could not safely go far in advance of public opinion without incurring ill consequences, including the possibility of men or morons taking the law into their own hands. He could not vote for the clause as it stood without amendment, nor could he vote for its deletion unless it were a step towards the introduction of a separate Bill to deal with the whole issue. Viscount STANSFORD said that Socialists regarded it as a duty and right for society to protect itself against poverty, disease, sickness, and crime. Those who supported the clause believed that you did more to produce murder by the degradation of the murder trial process than you corrected by the process of deterrence.

In opening the second day's debate Viscount SIMON expressed the view that the Commons debate showed no realisation that if capital punishment was abolished a new system of imprisonment must be devised—much harsher, longer, and contrary to everything that had been the object of prison reformers for the last 40 years.

Lord CHORLEY, who is president of the National Council for the Abolition of the Death Penalty, said the proposal was an experiment in this country, but it had been tried elsewhere with success. Punishment could only deter a man who had thought out his crime in advance, and statistics showed that the mass of these crimes were not premeditated. He asked their Lordships to sweep fear from their minds, and to sweep out at the same time this horrible penalty which had come down to us from primitive times. The amendment to delete the clause was carried by 181 votes to 28.

Subsequently an amendment moved by Lord GODDARD to retain whipping as a punishment but to abolish the cat o' nine tails was carried by 29 votes to 17.

#### Purchase-tax on Drugs

On the committee stage of the Finance (No. 2) Bill in the House of Commons on June 2, Mr. OSBERT PEAKE moved the first of a number of amendments intended to raise the whole question of purchase-tax on drugs and medicines. When the Chancellor of the Exchequer spoke of expanding the exempted list of medicines to a wider range of non-proprietary articles no-one could have envisaged that a wholesale discrimination between branded and proprietary medicines and non-branded

and prescribed articles of medicine was intended. The amendments proposed that all drugs and medicines should be exempted from the tax, as that was the only way now open to restore non-discrimination. For instance, Mr. Peake said, if a purchaser asked in a chemist's shop for a bottle of 'California Syrup of Figs' he would have to pay 33 $\frac{1}{3}$ % purchase-tax. But if the purchaser asked for compound syrup of figs B.P.C. he would escape purchase-tax. Mr. Peake argued that if the Chancellor of the Exchequer had only a certain amount of revenue to sacrifice, he ought to have sacrificed it evenly over the whole field of drugs and medicines, and a new special rate of purchase-tax could have applied to them at, say, 16 $\frac{2}{3}$ % or 20%. The only reason he could find which could seriously be advanced in favour of this new form of discrimination was that it was thought that these proprietary brands could afford the extra tax. It was quite unreasonable, however, to single out one trade for a special tax because it was thought that it was making too much profit on certain articles. It was for the public to judge freely on the prices quoted between the efficacy of one form of remedy and another.

In the course of the debate Mr. HUGH LINSTED, secretary of the Pharmaceutical Society, said that the tax would be passed on to the consumer and therefore it was a tax on sickness.

Mr. D. P. T. JAY, economic secretary to the Treasury, pointed out that no additional tax had been placed on anything and no tax was raised. Actually the Government had lightened the burden of tax paid by persons suffering from illness. They had aimed at exempting those medicines and drugs described in publications recognised as medical authorities, and including most preparations commonly used and of established medical value. Branded products had been excluded from the list of exemptions, not because they were necessarily without value, but because their inclusion would entail freeing virtually all the proprietary medicines from the tax, a loss of revenue which the Government could not afford. The point of these reliefs was that doctors would now be able to prescribe tax-free remedies for practically all ailments, and hospitals and institutions would be almost entirely relieved of the necessity to buy taxable drugs. The new exemptions would also enable housewives to buy tax-free simple drugs for the family medicine cupboard, such as aspirin and iodine. It should also be remembered that after July 5 everyone would be able under the National Health scheme to obtain free medicines prescribed by National Health Service doctors. The amendment was negatived by 275 votes to 156.

#### Spens Report III

In announcing the publication of the Spens report on the conditions of work and remuneration of consultants and specialists, Mr. ANEURIN BEVAN stated that the Government accepted the recommendations in principle. The task of evolving from it the best scheme of actual remuneration to suit all cases—and especially the bearing of the recommendations on remuneration for teaching duties—would be difficult, and would require the help of the profession in discussion. He proposed to begin this quickly, but whatever final scheme emerged would be deemed to operate from July 5 even if discussions were carried on past that date. Meanwhile interim contracts would be offered to specialists.

#### QUESTION TIME

##### Hospital Beds

Sir ERNEST GRAHAM-LITTLE asked the Minister of Health what proportion of beds were empty in hospitals in England and Wales upon any day which he might select for that enumeration during the past month; at what date the increase which had developed in the number of occupied beds began; and what was the sum of that increase.—Mr. BEVAN replied: My information is that at March 31 about one-ninth of the total beds were unoccupied for lack of staff and a further one-eleventh were staffed but vacant. Since Dec. 31 there appears to have been an increase of about 10,000 in the number of occupied beds but this increase is of course partly seasonal.

1. See *Lancet*, May 8, p. 731.

### National Health Service Benefits

Mr. PETER FREEMAN asked the Minister whether he would provide for a reduction or abolition of premiums to the National Health Service where no claim had been made after a period of years in order to discourage frivolous applications and encourage personal responsibility for good health.—Mr. BEVAN replied: The National Health Service is free to all and there are no premiums of any kind. The benefits available do not include cash benefits which are provided under the National Insurance Act.

### Medresco Hearing-aids

Mr. EDWARD EVANS asked the Minister whether he had calculated the number of persons who would be eligible on account of the disability of partial deafness to qualify for the Medresco hearing-aid; and on what basis his figures had been arrived at.—Mr. BEVAN replied: An estimate by experienced otologists based on a survey made for the Medical Research Council suggests that the number may be about 150,000.

## Obituary

### JOSEPH SEBRECHTS

Prof. Joseph Sebrechts died on March 26 at Bruges, where since 1910 he had created an important school of surgery. For many years now his clinic has drawn as visitors younger surgeons from this country as well as from other parts of the world, and in his own country it has long been recognised as a centre for postgraduate training. His British visitors were always made welcome and he never tired of doing what he could to demonstrate his methods and to make their visit interesting. In his turn he delighted to visit England. He was an honorary fellow of the Association of Surgeons and a fellow of the Royal Society of Medicine, where, it had been hoped that he would deliver last month an address on resection of the rectum.

"One of the features of Sebrechts's clinic," writes Prof. G. Grey Turner, "was the close personal attention which he gave to all the details, and this was evident from the first moment in the theatre. An enthusiastic pioneer in the use of spinal anaesthesia, he must have been one of the earliest and most devoted disciples of the late Howard Jones, whose methods he never tired of extolling.

"The technique was so organised as to cut out nearly all the possibilities of accident. Sebrechts was a general surgeon with wide interests and his work was conducted with a remarkable uniformity, and he seemed to excel in employing methods which he had made his own and which he felt it was fair to hand on to others with an assurance of their propriety. He operated with great assurance, all his movements being deliberate and purposeful, but in this way he got through a great volume of work. I was particularly struck with the very careful way in which he carried out the combined excision of the lowest part of the pelvic colon and upper rectum with restoration of continuity and preservation of the sphincters. This was done by thoroughly separating and mobilising the bowel from above and then completing the removal by withdrawing the separated rectum and colon through the denuded anal canal. This he did with apparent ease and I shall never forget the beauty of the exact and meticulous suturing of the cut end of the bowel to the remains of the anal mucous membrane. He went out of his way to show us the result in a convalescent patient, inviting one or two of us to test digitally the sphincter for ourselves.

"It was also a satisfaction to me to see this man with a busy surgical service taking the greatest care in carrying out the details of an ordinary gastro-enterostomy at a time—it was in 1931—when many people were rather careless about that operation and were talking as if it was perfectly safe in the hands of almost anybody.

"Sebrechts did a lot of emergency work and his methods of resuscitation and aftercare were well thought out and valuable. I was much impressed when I heard that, though he was at home for consultation between certain hours to which he adhered, he refused to give a fixed appointment to anyone in spite of their social position, for, as he said, he had no idea when he started his work how much time he would find it necessary to

spend on any patient, and he was not prepared to be hurried in response to the dictates of the clock.

"The delightful old city of Bruges with its quiet artistic features seemed to accord with the temperament of this quietly industrious earnest man. He had a large family to whom he was devoted, and those of us who met him in London at the congress of the International Society of Surgery last September will recall sympathetically the pride with which he introduced one of his sons to the surgical world."

### THE LATE MR. OLLERENSHAW

HAVING known Mr. Ollerenshaw from his student days onwards, J. B. M. writes: "It was characteristic of him that paediatric surgery should hold a high position in his affections, largely because of his love of children. He was skilful in winning their confidence and coöperation and in calming their natural suspicions. For the first years after he joined the staff of the Salford Royal Hospital in 1910 he was a general surgeon, but by arrangement with his colleagues he turned over to orthopaedics after the 1914-18 war. The department which he thus established grew steadily and continuously in importance and scope as a reward of his consistent and strenuous endeavour and has come to be recognised universally as of excellent standing.

"He was an expert surgeon, always thoughtful and realistic, and not without inventive capacity. His rather large hands could be unexpectedly gentle and skilful, and I recall how long ago, in the days before he limited his attention to orthopaedics, I watched with admiration his adroit management of a cleft palate, a province which it is regrettable he had to forsake, for his results in it were well above the average. For twenty years he was a lecturer in orthopaedic surgery at the Manchester University and his lectures were lucid and practical. While more than generous in his bearing towards all those whom he liked and respected, he could be outspoken and intolerant in the presence of incompetence or obstruction, and he had, on occasion, a pretty wit which he could use devastatingly.

"Bob Oller (as he was called by his intimates) was, like many surgeons, a lover of good music. He played the piano, cello and oboe with much enjoyment and had frequently played in amateur orchestras. In later life music became an increasing interest. For 15 years he had been an active member of the committee of the Hallé Concerts Society and was always to be seen at their concerts. He was knowledgeable about conductors and performers, having a splendid memory for previous performances.

"As is true of most lovable men, he himself had a capacity for strong affection which embraced many friends; he had an inner circle, but he was a good mixer with a flair for sociability. I myself look back on nearly half a century of his friendship with gratitude and with appreciation for much help, wise counsel, and good humour."

### CHARLES SAMSON THOMSON

M.D. GLASG., D.HY. DURH., D.P.H.

Dr. C. S. Thomson, who died at his home in Ayr on May 30, was medical superintendent officer of health in Belfast from 1928 to 1945.

He was born at Ayr in 1880, and graduated M.B. at Glasgow University in 1906. After holding a house-appointment at Sunderland Infirmary he took the B.HY. with honours at Durham University in 1908, and two years later he was appointed senior assistant M.O.H. for Cumberland. In 1912 he became M.O.H. for Worthington in the same county, and the thesis for which in 1912 he was awarded his M.D. with commendation was on the Medical Inspection of Schools and School-children with special reference to Cumberland. It was



(F. W. Schmidt)

published in 1919. Meanwhile, during the 1914–18 war he had served with the R.A.M.C. as a bacteriologist. For his work as officer in charge of Karaissi refugee camps during the Balkan campaign the Greek government conferred on him their Order of Military Merit.

In 1920 he became M.O.H. for Hyde, Cheshire, and a year later for Deptford, a post which he held till he was appointed to Belfast. While in Belfast he was also a lecturer in public-health administration in the Queen's University. In 1937 Dr. Thomson received the Smith award, given triennially by the Royal Institute of Public Health and Hygiene to the medical officer of health who, "in the discharge of his duties, rendered the most noteworthy work in the department of preventive medicine." The following year he became the seventh doctor of hygiene of the University of Durham.

A colleague writes: "Thomson was a fluent speaker and had the happy faculty of expressing his remarks in a humorous vein. Enthusiastic in all his work, he did much to improve the health services for which he was responsible. A man of genial disposition, kind, and considerate, with an aptitude for making friends, he was held in high esteem by the members of his health authorities and his colleagues." When he retired in 1945 his staff in the Belfast public-health services presented him with an illuminated address.

His son, another Charles Thomson, holds an appointment as a medical officer of health in Norfolk.

Dr. DANIEL DOUGAL, professor of obstetrics and gynaecology in the University of Manchester, died on June 4, at the age of 63.

## Appointments

BULL, J. W. D., M.D. Camb., M.R.C.P., D.M.R.: asst. radiologist, National Hospital, Queen Square, London.

COHEN, N. A., B.Sc. Wales, M.R.C.S.: asst. physician, Runwell Hospital, Essex.

DAVIDSON-LAMB, WILLIAM, M.C., M.B. Aberd., D.P.H.: asst. county M.O., Derbyshire.

HART, E. W., M.B.E., M.D. Camb., M.R.C.P., D.C.H.: paediatrician, Hampstead General and North-West London Hospital.

HAYNES, W. N. L., M.R.C.S.: asst. physician, Runwell Hospital, Essex.

MONORIEFF, ZINA E., M.B. Aberd., M.R.C.P., D.C.H.: asst. physician, children's dept., Royal Free Hospital, London.

### St. Thomas's Hospital, London:

ANDERSON, H. J., M.B. Camb., M.R.C.P.: physician to outpatients.

BOGGO, R. H., M.S. Lond., F.R.C.S.: surgeon.

DORNHORST, HELEN M., M.B. Edin., D.M.R.: temp. chief assistant, radiotherapy dept.

ROB, C. G., M.C., M.CHIR. Camb., F.R.C.S.: surgeon in charge of outpatients.

SARGANT, W. W., M.B. Camb., M.R.C.P., D.P.M.: physician, dept. of psychological medicine.

## Births, Marriages, and Deaths

### BIRTHS

BARBER.—On May 29, at Buxton, Derbyshire, the wife of Dr. H. S. Barber—a daughter.

GALLAGHER.—On May 30, in London, the wife of Lieut.-Colonel C. E. Gallagher, O.B.E., M.R.C.S.—a daughter.

HARWOOD.—On June 2, in 77 B.M.H., B.A.O.R., the wife of Captain R. P. Harwood—a daughter.

MARSHALL.—On June 2, at Wolverhampton, the wife of Dr. A. G. Marshall—a daughter.

MORRIS.—On June 7, in London, the wife of Dr. David Morris—a daughter.

SHARROD.—On May 31, at Brisbane, the wife of Dr. F. J. Sharrod—a daughter.

SMYTHE-WOOD.—On June 4, the wife of Dr. P. Smythe-Wood—a daughter.

WISE.—On May 27, at Sandwich, the wife of Dr. C. S. Wise—a daughter.

### MARRIAGES

BROWN—JACOBS.—On May 29, at Gullford, David Fergriewo Brown to Barbara Millicent Filmer Jacobs, M.R.C.S.

### DEATHS

DOUGAL.—On June 4, in Manchester, Daniel Dougal, M.C., M.D. Manc., F.R.C.O.G., professor of obstetrics and gynaecology in the University of Manchester, aged 63.

HATRICK.—On May 31, at Surbiton, Charles Dainty Hatrick, M.D. Lond., aged 72.

INNESS.—On May 30, at Bidford, William James Deacon Inness, C.M.G., M.R.C.S., D.P.H., late director of the West African Medical Services.

OXFORD.—On May 30, in London, the Reverend Arnold Whitaker Oxford, D.M. Oxf., aged 93.

TATCHELL.—On June 1, Percy Tatchell, M.R.C.S., aged 74.

WELSH.—On May 13, at Wabroonga, Australia, David Arthur Welsh, M.A., M.D. Edin., B.Sc., F.R.C.P.E., emeritus professor of pathology in the University of Sydney.

## Notes and News

### SHORTAGE OF MEDICAL RECRUITS

EXCEPTIONAL measures have been found necessary to prevent the supply of general-duty medical officers to H.M. Forces during the second half of 1948 falling far short of requirements. On the recommendation of the Medical Priority Committee, the Minister of Health has asked the Central Medical War Committee to recruit, on the termination of "A" appointments, all young practitioners, liable for military service, who complete a six months' tenure of these appointments during the six months beginning on July 1. Such practitioners will not be permitted to proceed to "B2" posts but will retain the right to appeal against recruitment on the ground of conscience and to appeal for postponement of recruitment on the ground of exceptional personal hardship. A circular on the subject will be issued as soon as possible by the C.M.W.C. to all hospital authorities.

### BOOKBINDING AT ROBERT JONES MEMORIAL WORKSHOPS

LAST July these workshops, which had been closed during the war, were reopened to train severely disabled men in need of sheltered employment. Departments for bookbinding, leather-work, rug-making, and the manufacture of paper carrier bags are already in full swing, and it is hoped soon to start a small printing press. The workshops have always specialised in bookbinding, and today over 30 men are under training or employed in this department. If enough orders are forthcoming it is hoped to raise the number to 50. We are informed that some doctors in Liverpool have already arranged to have their *Lancets* bound at the workshops. Others who would like to follow their example should write to the manager, Colonel B. A. Carr, Sir Robert Jones Memorial Workshops, 74, Upper Parliament Street, Liverpool, 8.

### NATIONAL ASSISTANCE

DRAFT regulations for grants under the National Assistance scheme, which comes into force on July 5, are summarised in a memorandum<sup>1</sup> published last week. The new comprehensive National Assistance Service is to replace the present limited schemes of supplementary pensions and unemployment assistance (administered by the Assistance Board), and poor-law relief, assistance to the blind, and tuberculosis treatment-allowances (administered by local authorities).

The main weekly rates will be as follows: for a person living alone 24s., plus an allowance for rent (usually the rent actually paid); and for a married couple living by themselves 40s., plus a similar rent allowance. The National Assistance Act requires special provision for the blind and for those who have suffered loss of income in order to undergo treatment for respiratory tuberculosis. For each of these groups the main scale rates are as follows: 39s. for a single person and 55s. for a married couple, additions for rent being made as in the ordinary scale. For a married couple both of whom are blind the scale rate will be 65s. The new allowances to the tuberculous supplant those paid under the national scheme of tuberculosis treatment-allowances introduced by health departments and operated by local authorities. The National Assistance Board will be prepared to use their discretion in favour of patients who, because of financial difficulties, are deterred from seeking treatment for tuberculosis.

### AN INTERNATIONAL JOURNAL OF COMPARATIVE PHYSIOLOGY

THE Dutch have a geographical, linguistic, and academic right to regard themselves as a centre or clearing house for European scientific research and information. Many Dutch biologists have visited us since the war, and from them we had our first news of the biological research that had been going on in Germany. This unofficial liaison work has now taken a more solid form, for our Dutch colleagues made it clear that they intended to start several truly international journals in the biological field. *Behaviour*, now well established, was the first of these journals to appear; and now vol. 1, no. 1 of a new quarterly, *Physiologia Comparata et Oecologia*, has been published. The new journal<sup>2</sup> has sixteen editors: the score card reads Holland 4, U.S.A. 3, Britain 2,

1. Explanatory Memorandum on the Draft National Assistance (Determination of Need) Regulations, 1948. Cmd. 7423. H.M. Stationery Office. Pp. 10. 3d.  
2. Published by Dr. W. Junk, The Hague, Holland. Annual subscription 36 Dutch fl.



France 2, and the Argentine, Brazil, Switzerland, Belgium, and China 1 each. Britain's representatives are, naturally enough, Dr. C. F. A. Pantin, F.R.S., of Cambridge, and Prof. C. M. Yonge, F.R.S., of Glasgow. The first issue has five papers, of which three are in English, one in French, and one in German; all papers have to have summaries in French or English. The subject-matter covers a wider range than is customary in English specialised journals—papers on the breeding of *Lepus europæus* in captivity and the electrolyte balance in the body fluids of the swan mussel are combined with a fine physiological analysis by T. H. Bullock of the giant fibre system of polychæte worms. Because of our priority in this type of analysis, a paper by C. Romijn on the respiratory movements of the chick on the day before hatching will be specially welcomed here.

#### INTERNATIONAL HÆMATOLOGICAL REUNION

THE French Hæmatological Society held an international reunion in Paris from May 23 to 27, at which arrangements were made for the formation of a European Hæmatological Society. The preliminary work in connexion with this will be done by Dr. Sven Moeschlin of the Swiss Hæmatological Society, and it is hoped to hold the first meeting in Zurich in 1950.

The present position of hæmatology was reviewed by speakers from almost all the countries west of the Iron Curtain. Unfortunately, Rumania, Hungary, and Czechoslovakia were not represented, although several well-known workers from these countries had accepted invitations. Great Britain was represented by only three visitors, perhaps because there is no hæmatological society in the British Isles.

The subjects of the meetings were divided into groups, most of which dealt with cytology or blood coagulation. Remarkably little attention was given to blood-groups and blood-transfusion, but Bessis gave an address on the technique and indications for exsanguino-transfusion which he has used with temporary success in acute leukæmia. A whole morning was devoted to the treatment of blood diseases, especially to the use of urethane in the leukæmias. Moeschlin discussed the mode of action of this substance, which, contrary to previous opinion, does not appear to exert its effect during the process of mitosis but on the resting nucleus with effects on the mitotic process. Oddly enough, he seems to have found urethane much more likely to cause agranulocytosis than had other speakers (Storti, Mallarmé, Lambin, and Finey). Baserga and Marinone, of Pavia, reported on a considerable series of cases of Hodgkin's disease treated with nitrogen mustard. Their results were similar to those described by other workers inasmuch as it was often possible to induce a further remission even when radio-resistance had developed. Nolf, the veteran physiologist of Brussels, reviewed the whole subject of coagulation, a remarkable feat for a man whose work on the subject extends over half a century. On the last morning delegates visited the National Transfusion Centre (Tzanck) where they were impressed by the excellent arrangements for bleeding; their surprise at finding that there was no shortage of donors diminished considerably when they learnt that each donor receives tickets for extra rations.

The success of the reunion was attributable to the hard work of Paul Chevallier, who had arranged both the scientific and social activities with remarkable completeness.

#### National Insurance Contributions by Students

The position of students under the National Insurance Act has been reconsidered<sup>1</sup>; and under regulations to be made shortly, those undergoing full-time education at schools, universities, technical colleges, and similar institutions will after all not be required to pay contributions, though they may do so if they wish. A student who undertakes paid work during vacations will be required to contribute in the same way as other employees.

#### Medical Insurance Agency

At the annual meeting held on June 3, rebates of premium to members of the profession were announced amounting to £11,000. Allocations to the medical charities will, largely by reason of the covenant system, reach about £15,000. Dr. J. A. Brown, Sir Francis Fraser, Sir Robert Hutchison, Dr. Roche Lynch, Sir Ewen Maclean, and Mr. H. S. Souttar were reappointed members of the committee of management for the next three years. Dr. James Fenton was reappointed chairman and Dr. Henry Robinson hon. secretary.

1. See *Lancet*, May 8, p. 735.

#### University of Cambridge

On May 29 the following degrees were conferred:  
M.D.—K. S. MacLean, P. F. Barwood.

#### University of London

The following have been appointed to the senate for the period 1948–52: Mr. P. H. Mitchiner, Prof. R. V. Christie, and Dr. E. R. Boland. The senate have also coöpted Sir Francis Fraser.

Prof. J. W. S. Blacklock has been appointed to the chair of pathology at St. Bartholomew's Hospital medical college as from Oct. 1.

Dr. Blacklock graduated M.B. Glasg. with honours in 1920. After serving as assistant to the professor of pathology at Glasgow University he was appointed lecturer in pathological histology and Gardiner research lecturer in the pathology of diseases of infancy and childhood. He also held the appointment of assistant pathologist to the Western Infirmary. While he was pathologist to the Royal Hospital for Sick Children, Glasgow, he published a catalogue of the pathological museum of the hospital. In 1931 he was awarded the Bellahouston gold medal for his M.D. thesis, and the following year he wrote for the Medical Research Council a special report on the pathology and bacteriology of tuberculous disease in children. His other publications include a paper on neurogenic tumours of the sympathetic system in children. In 1937 he was appointed to the St. Mungo (Notman) chair of pathology in the University of Glasgow and to the directorship of the institute of pathology at the Royal Infirmary.

Mr. James Whillis has been appointed to the chair of anatomy at Guy's Hospital as from Oct. 1.

Mr. Whillis received his medical education at Durham University, where he took the M.B. in 1922, and he held the lectureship in anatomy there before taking up his present appointment in 1935 as reader in anatomy at Guy's. The second edition of his *Elementary Anatomy and Physiology* appeared in 1944, and he has also been a joint editor of the latest editions of *Gray's Anatomy*.

The title of reader in biochemistry has been conferred on Mr. Wilfrid Lawson, M.Sc., in respect of the post held by him at Middlesex Hospital, and the title of reader in morbid anatomy on Dr. D. M. Pryce in respect of the post held by him at St. Mary's Hospital.

#### University of Glasgow

Dr. George Wyburn has been appointed to the regius chair of anatomy. Dr. Wyburn, who graduated M.B. Glasg. in 1925, at present holds the post of senior lecturer in the anatomy department of the university.

#### Royal College of Physicians of London

Dr. J. W. Trevan, F.R.S., will deliver the Bertram Louis Abrahams lecture at the college, Pall Mall East, S.W.1, on Tuesday, July 13, at 5 P.M. He is to speak on *Curare and Curarimimetic Drugs*. Dr. Robert Coope's Mitchell lecture has been postponed till Thursday, Nov. 18.

#### Health of the People Exhibition

This exhibition at Oxford Street, Marble Arch, London, W.1, which has been produced for the Ministry of Health by the Central Office of Information to mark the centenary of the first Public Health Act, will remain open until Saturday, June 19. It may be visited from 10 A.M. till 9 P.M. daily, and from 2 P.M. till 8 P.M. on Sundays.

#### National Corporation for the Care of Old People

During the past six months the corporation has made grants of over £200,000 for the welfare of the aged. Grants for homes, or other special accommodation for old people, account for £180,450; of this £174,300 is for establishing 61 new homes (at a total cost of about £575,000) which will accommodate 1660 old people. Grants for old people's clubs total £8670.

#### Population and World Resources in Relation to the Family

Lord Horder will preside over the international congress on this subject which is being held at Cheltenham from Aug. 23 to 27. Sir John Boyd Orr, F.R.S., is to speak on *World Resources*, Prof. Whelpton (U.S.A.) on *Population Trends*, and Prof. T. H. Davey on *Migration as a Factor in the Adjustment of National Populations*. Other speakers will include Dr. Nils Nielsen (Sweden), Mr. Kenneth Walker, Dr. Abraham Stone (U.S.A.), and Mr. Joseph Needham, F.R.S. Delegates from France, India, China, Sweden, Holland, and Italy will take part in a discussion on *Sociological, Religious, and Political Implications of Family Limitation*. There will also be a series of group discussions. Further information may be had from the congress organiser, N. A. Howell-Everson, 37, Park Street, London, W.1.

**Royal College of Obstetricians and Gynaecologists**

At a meeting of the council held on May 22, with Mr. William Gilliatt, the president, in the chair, Dr. Emil Novak (Baltimore) was elected an honorary fellow. Prof. N. W. Philpott (Montreal) was appointed William Blair Bell lecturer for 1948.

The following were elected to the council:

O'Donel T. D. Browne, Malcolm Donaldson, H. L. Hardy Greer, Hilda N. Lloyd, H. J. Malkin, Douglas Miller, H. J. Draw Smythe (as representatives of the fellows); D. B. Fraser, R. J. Wotherspoon (as representatives of the members).

The following were admitted to the fellowship:

J. O. Baker, S. C. Bose, F. J. Burke, H. H. Caple, William Clement, G. J. St. C. Fisher, Israel Goldberg, C. J. K. Hamilton, J. S. Henry, O. S. Heyns, John Howkins, J. G. H. Ince, Hilda M. Lazarus, D. M. Lindsay, Ralph Lodge, D. M. Low, J. R. McArthur, C. F. Mackenzie, P. A. McLeod, R. B. Meiklejohn, Jocelyn A. M. Moore, A. B. Nash, I. Y. Patrick, Susanne J. Paterson, H. N. Ray, Helen E. Rodway, W. N. Searle, G. A. Simpson, J. R. Vant, G. M. White, W. R. Winterton.

The following were admitted to the membership:

S. C. Anderson, E. C. Bryant, Margaret E. M. Boulton, J. M. Bowen, J. C. McC. Brown, J. T. Burrows, R. W. Burslem, A. W. Chester, John Crawford, L. A. Cruttenden, P. C. Denham, J. C. H. Dunlop, Sidney Evans, J. B. Fleming, J. F. Foulkes, D. C. Galloway, S. F. Hans, Betty Hargreaves, J. R. Hassard, Rosa Hertz, J. B. Hurl, P. S. Jalkanen, Eileen I. Jamieson, E. W. Jones, M. M. Kriseman, Sylvia Lerer, Una G. Lister, Florence P. Logan, J. T. Louw, S. D. Loxton, A. M. Michael, N. V. Mody, Cecilia M. Murray, G. S. Musgrove, M. J. D. Noble, Khorsheed Pasricha, R. G. Patel, A. E. Poreta, P. T. Por, R. W. K. Purser, T. F. Redman, O. A. Schmidt, Francis Shaw, B. H. Sheares, D. M. Sheppard, W. R. Sloan, B. S. Surti, D. A. Thomson, J. G. Thurston, May D. Westerman.

**North-West Metropolitan Hospital Region Advisory Committee on Psychiatry**

The psychiatrists in this region met early this year to consider the formation of an advisory committee and it was agreed to elect a committee to represent various aspects of the psychiatric services. A list of those who might be engaged in the regional psychiatric services was compiled (about 220 in number) and this list was used as the electorate. The members of the committee are:

*Mental hospitals.*—Dr. A. C. Dalzell, Dr. J. B. S. Lewis, and Dr. S. A. MacKeith (deputy chairman).  
*Mental deficiency.*—Dr. N. H. M. Burke and Dr. J. H. Watkin.  
*Adult outpatient clinics.*—Dr. E. A. Bennet, Dr. B. C. M. Gilsenan, and Dr. J. D. Sutherland (secretary).  
*Child-guidance clinics.*—Dr. J. Bowlby (treasurer), Dr. W. Moodie, and Dr. D. W. Winnicott.  
*Teaching hospitals.*—Dr. E. M. Creak and Dr. N. G. Harris.  
*Observation wards.*—Dr. N. McDiarmid.  
*General.*—Dr. D. Carroll, Dr. W. J. T. Kimber (chairman), Dr. D. Odlum, and Dr. J. Rickman.  
*Representative of psychiatric social workers.*—Miss M. L. Ferard.  
*Representative of professional psychologists.*—Mrs. J. M. Williams.

The committee has held its first meetings with Dr. J. R. Rees, member of the regional hospital board, and Dr. C. Kenton, regional psychiatrist, in attendance. Psychiatrists who are not yet in touch with the committee are asked to communicate with the secretary, 2, Beaumont Street, London, W.1.

An informal group of psychiatrists has prepared a survey of the psychiatric needs in the region. Copies of this report are available from the secretary of the committee (price 5s.).

**R.A.F. Medical Branch**

The annual dinner will be held at the Dorchester Hotel, London, W.1, on Friday, Oct. 8. Further particulars will be found in our advertisement columns.

**British Rheumatic Association**

The Lord Mayor of London will preside at the inaugural meeting of the association, which is being held at the Mansion House on Thursday, June 17, at 3.30 P.M. The speakers will include Dr. F. Hernaman-Johnson, Lord Horder, and Colonel M. Stoddart-Scott.

**Maternity and Child Welfare Conference**

The annual conference of the National Association of Maternity and Child Welfare Centres is to be opened at Friends House, Euston Road, London, W.1, at 10.15 A.M., on June 23, and will continue until June 25. The theme is the State and Family Life.

**Medical Illustration**

An exhibition of medical paintings by Miss Anna Zinkeisen, to be held at the Royal Society of Medicine, 1, Wimpole Street, London, W.1, will be opened by Sir Maurice Cassidy, the society's president, at 11 A.M. on June 21. The exhibition will continue until July 3.

**North-East Metropolitan Region**

All members of specialist and consultant staffs in this region are invited to attend a meeting at B.M.A. House at 8 P.M. on Friday, June 18, to consider the formation of an interim consultants' and specialists' committee for the region, on the lines suggested in the annual report of the council of the British Medical Association.

**Register of Speech Therapists**

The 1948 edition of this register, published by the Board of Registration of Medical Auxiliaries, is now obtainable, without charge, from the registrar of the board, Tavistock House North, Tavistock Square, London, W.C.1.

**Society for Endocrinology**

Prof. E. B. Astwood (Boston) will give a lecture to the society at the Middlesex Hospital medical school, London, W.1, on Thursday, July 8, at 5 P.M., when Prof. E. C. Dodds, F.R.S., will be in the chair. Professor Astwood is to speak on Recent Advances in the Physiology of the Thyroid Gland.

**Society of Medical Officers of Health**

Under the presidency of Dr. J. Greenwood Wilson, the county borough group of the society will hold their annual meeting and conference this year at Aberdare Hall, Cathays Park, Cardiff, from July 2 to 4. The speakers will include: Dr. E. K. Macdonald, Dr. Charles Fletcher, Dr. D. A. Williams, Mr. D. B. E. Foster, and Dr. W. G. Patterson.

**DISCLAIMER: Treatment of Rheumatism.**—The medical committee of the Charterhouse Rheumatism Clinic, London, wish to dissociate themselves from a recent newspaper statement connected with a visit to the clinic by the Duchess of Gloucester. No potential new drug for the treatment of chronic rheumatic diseases is under investigation at the clinic.

**CORRIGENDUM.**—The price of B. Thorell's Studies on the Formation of Cellular Substances during Blood-cell Production is 12s. (and not 5s. as stated in our issue of May 22, p. 798).

**Diary of the Week**

JUNE 13 TO 19

**Monday, 14th**

ROYAL COLLEGE OF PHYSICIANS, Pall Mall East, S.W.1  
5 P.M. Dr. R. R. Bomford: Steatorrhea.  
ROYAL COLLEGE OF SURGEONS, Lincoln's Inn Fields, W.C.2  
5 P.M. Mr. Eric Lloyd: Fractures in Childhood.

**Tuesday, 15th**

ROYAL COLLEGE OF PHYSICIANS  
5 P.M. Sir Philip Manson-Bahr: Lesson of Tropical Medicine. (First of two lectures.)  
ROYAL COLLEGE OF SURGEONS  
5 P.M. Sir Thomas Fairbank: Abnormalities of the Skeleton.  
WEST LONDON MEDICO-CHIRURGICAL SOCIETY  
8.30 P.M. (1, Wimpole Street, W.1.) Prof. E. M. da C. Andrade, D.S.C., F.R.S.: The Atom and Its Energy. (Cavendish lecture.)  
INSTITUTE OF DERMATOLOGY, 5, Lisle Street, W.C.2  
5 P.M. Dr. Henry Corsi: Diseases of the Nails.

**Wednesday, 16th**

ROYAL COLLEGE OF SURGEONS  
5 P.M. Sir Lancelot Barrington-Ward: Acute Abdominal Emergencies.  
ROYAL COLLEGE OF SURGEONS OF EDINBURGH, 18, Nicolson Street, Edinburgh, 8  
5 P.M. Prof. René Leriche: Experimental and Human Surgery of the Abdominal Aorta.

**Thursday, 17th**

ROYAL COLLEGE OF PHYSICIANS  
5 P.M. Dr. Desmond Curran: lecture demonstration of cases after prefrontal leucotomy.  
ROYAL COLLEGE OF SURGEONS  
5 P.M. Mr. G. H. Macnab: Surgery of the Newborn.  
ROYAL SOCIETY OF TROPICAL MEDICINE AND HYGIENE, 26, Portland Place, W.1  
8.15 P.M. Prof. M. Erfan (Cairo): Pulmonary Bilharziasis.  
ROYAL SOCIETY, Burlington House, Piccadilly, W.1  
2.30 P.M. Sir Paul Fildes, F.R.S.: Analogues of Growth Factors in Relation to Antibiotics.

**Friday, 18th**

ROYAL COLLEGE OF PHYSICIANS  
5 P.M. Dr. Curran: Electrical Convulsion Therapy on Outpatients.  
ROYAL COLLEGE OF SURGEONS  
5 P.M. Mr. H. P. Winsbury-White: Surgery of the Lower Urinary Tract.

# THE LANCET

A JOURNAL OF BRITISH AND FOREIGN MEDICINE, SURGERY, OBSTETRICS, PHYSIOLOGY, PATHOLOGY, PHARMACOLOGY, PUBLIC HEALTH, AND NEWS

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## THE GEOGRAPHICAL ORIGIN OF NURSES

BARNET WOOLF

M.A., Ph.D. Camb., F.R.S.E.

LECTURER IN MEDICAL STATISTICS IN THE UNIVERSITY OF  
EDINBURGH

ANYBODY who has worked in a hospital must have observed that a very large proportion of nurses are country girls and he may have wondered whether the towns are providing their fair share of recruits to the profession. If it is true that town girls show a special reluctance to nursing, a radically new method is needed to attract recruits. I have therefore undertaken a statistical investigation into the geographical origin of nurses.

The most recent information, when this work was started, related to 1945. The *Registers of Nurses*, dated 1946, published by the General Nursing Councils for England and Wales and for Scotland, list all nurses qualified for State registration by the end of 1945, distinguishing female general nurses (S.R.N.), male nurses, mental nurses (male and female), and female nurses for mental defectives, sick children, and fevers. The total number of new registrations in Great Britain during 1945 was 10,002, of whom 8031 (80.3%) were female general nurses.

Not all the new registrations are new entrants to the profession, for many nurses take two or more qualifications. Thus about 7.4% of the new general nurses in England and Wales were already registered on one or more of the special lists.

To obtain a fair figure for a typical yearly intake, one must devise a procedure that will count each person on one occasion only. I have therefore concentrated primarily on additions during 1945 to the general part of the Register. If one excludes transfers from abroad, multiple qualifications, and male nurses, the total yearly output of qualified female nurses is about 9000, of whom about 90% obtain the S.R.N. certificate.

Each Register entry gives name and permanent address and date and method of qualification. My first step was to go through the two Registers of general nurses and mark all entries dated 1945. About 100 of these were nurses trained in some other Empire country, transferring their registration on coming to live in Britain. The remainder have achieved registration by examination after training in British hospitals. With newly qualified nurses it is safe to assume that the address given at registration is almost always the nurse's home of origin.

Out of the 7916 newly qualified general nurses trained in Great Britain, 6421 (81%) were domiciled in England and Wales, 918 (11.6%) in Scotland, and 436 (5.5%) in Eire. There were also 91 from Northern Ireland, 14 from the Channel Islands, and 36 from places outside the British Isles. The nurses domiciled in Great Britain gave the following results:

<i>Domiciled in England and Wales</i>	<i>Number</i>
Total .. .. .	6421
<i>1 in 3 sample:</i>	
County of London .. .. .	103 (1.6%)
County boroughs .. .. .	374 (5.8%)
Total large towns .. .. .	477 (7.4%)
Remainder .. .. .	1663 (25.7%)
Total .. .. .	2140
<i>Domiciled in Scotland</i>	
Large burghs .. .. .	316 (4.8%)
Remainder .. .. .	602 (9.1%)
Total .. .. .	918

England and Wales was divided into the county of London, the county boroughs, and the remainder. The first two groups are highly urbanised. The remainder includes most of the built-up area of Greater London,

the suburbs of the county boroughs, the municipal boroughs, and the urban districts, all of which are urban, as well as the rural districts. I also tried to identify all addresses in municipal boroughs, but there were so many doubtful cases that the attempt was abandoned.

A random 1 in 3 sample was taken of the 6421 nurses, comprising 2140 names. I noted every address in the London postal district or containing the name of any of the 83 county boroughs. Each address was then identified on a large-scale map. Many of the houses were outside the boundary of the borough named in the address. The few doubtful cases were assigned within the borough boundary. The result shows that 22.3% of the addresses were in the two highly urbanised groups, and 77.7% in the partly urban, partly rural remainder. The 918 nurses domiciled in Scotland were similarly subdivided into 34.4% domiciled in the 24 recognised large burghs, and 65.6% in the remainder of the country.

## NUMBER QUALIFYING AND NUMBER ELIGIBLE

These figures are not very informative until they are compared with the relative populations from which the various groups of nurses are drawn. The most useful comparison is not with total population but with the number of girls eligible to become nurses in a typical year. This would be a yearly age-group at the age at

## NURSES BY GEOGRAPHICAL ORIGIN, IN RELATION TO NUMBERS OF ELIGIBLE GIRLS

Area of origin	Eligible girls	General nurses qualifying	Ratio to eligible girls	All nursing recruits	Ratio to eligible girls
<i>England and Wales:</i>					
County of London..	27,763	309	1 in 90	630	1 in 41
County boroughs ..	111,351	1122	1 in 99	2468	1 in 45
Total large towns ..	139,114	1431	1 in 97	3148	1 in 44
Remainder .. .. .	200,286	4989	1 in 40	10,976	1 in 18
Total .. .. .	339,400	6420	1 in 53	14,124	1 in 24
<i>Scotland:</i>					
Large burghs .. .. .	24,770	316	1 in 78	695	1 in 36
Remainder .. .. .	18,570	602	1 in 31	1324	1 in 14
Total .. .. .	43,340	918	1 in 47	2019	1 in 21
Total Great Britain ..	382,740	7338	1 in 52	16,143	1 in 24

which nurses achieve registration. The statutory minimal age is 21, and data are available showing that about two-thirds of new registrations are of girls under 25. No serious error will be committed if one takes the population eligible to become nurses in a given year as a fifth of all girls in the age-group 20 years old but under 25. One therefore requires figures for the number of females in this age-group in the geographical groups set out above. In normal times these figures could readily be obtained from official sources. Owing to war disturbances of population and of publication, however, figures for 1945 must be estimates.

The Registrar-General for England and Wales gives 1,697,000 as the estimated number of females in mid-1945 in the five-year age-group 20-24, and a fifth of this—i.e., 339,400—has been taken as the number of girls eligible to become nurses.

For subdivisions of the country only total population estimates are available, without details of age and sex. It is known that the proportion of young adults in the population is larger in urban than in rural districts. I have weighted the population figures for the county of London, the county boroughs, and the remainder by the relative proportions of girls aged 20-24 as found in the census of 1931, obtaining the estimates of eligible girls in the first column of the accompanying table.

For Scotland the Registrar-General gives an estimate for mid-1945 for the ten-year age-group 15-24, excluding girls serving with the Forces. I have assumed that the ratio of girls aged 15-19 to those aged 20-24, and the ratio of serving to total girls, are the same in Scotland as in England and Wales, obtaining the figure of 43,340 as the estimated number of eligible girls in the whole of Scotland. These have been allocated to the large burghs and the remainder by the method described above.

The second column in the table gives the actual numbers of newly qualified general nurses supplied by each area, as disclosed by the analysis already set out. The figures for England and Wales are those in the 1 in 3 sample, multiplied by 3. The third column shows the ratio of qualifying nurses to eligible girls. In England and Wales as a whole about 1 girl in 53 qualifies, and about 1 in 47 in Scotland. In both countries there is a big contrast between the larger towns and the remainder. The most intensely urbanised areas, the large towns of England and Wales, make the smallest relative contribution—about 1 qualified nurse per 97 eligible girls. The Scottish burghs, with a much smaller average population, give a rate of 1 in 78. Glasgow, with its population of about 1,000,000, yielded only 1 S.R.N. from each 102 eligible girls, while the remainder of the Scottish large burghs had an average rate of 1 out of 69 possibles. The most rural of the divisions shown in the table is the remainder in Scotland, where 1 girl out of 31 qualified as a general nurse. The remainder in England and Wales, which contains a large admixture of urban areas, gives the correspondingly higher rate of 1 nurse in 40 girls.

These figures probably underestimate the contrast between town and country. I have calculated the numbers of eligible girls on the assumption that the relative age-composition of the various populations was the same in 1945 as in 1931. But there were big changes, mainly due to war-time evacuation from the larger towns. Those who went were preferentially mothers, children, and old people. There was therefore a much higher proportion of young girls in the remaining population than appears from the 1931 figures; so my estimate of eligible girls in the towns is too low, and that for the remainder groups is correspondingly too high. This is especially notable in the case of the county of London, whose pre-war population of about 4,000,000 had fallen in 1945 to about 2,600,000—a drop of about 35%. The evacuation of girls of the eligible age-group must have been much less than this, and the recruitment-rate of qualified nurses was probably 1 in 100 or more, instead of the 1 in 90 shown in the table.

#### ENTRY OF RECRUITS

So far I have been considering only nurses who successfully complete their general training. To get a fair picture of the total entry of girls into the training schools one must add on two more large groups: (1) those who qualify on one or more special parts of the Register, without obtaining a general qualification; and (2) those who start training but leave before completion. Though the raw data exist in the Registers of nurses for the enumeration of the first group, the statistical work would be extremely laborious, since each name would have to be looked up in every part of the Register to ensure that girls with multiple qualifications are counted once only. A small pilot study indicated that the nurses in this group domiciled in Great Britain may be conservatively estimated as about 10% of the qualified general nurses. The preponderance of country girls in this group is even greater than among the general nurses. If one adds 10% to each of the figures in the second column of the table this will give a reasonably good estimate of the number of nurses qualifying on all parts of the Register, with the proviso that the contrast between town and country is probably greater than the figures appear to indicate.

For the number of probationer nurses leaving during training we have no precise sources of information. There are, however, two estimates based on sample inquiries: (1) that of THE LANCET Commission on Nursing (1932); and (2) that of the official Working Party on the Recruitment and Training of Nurses (1947). Both estimates agree that only about half the girls entering the training schools achieve registration. The Working Party puts the wastage at about 54% of the intake. To get an estimate of the total number of recruits to all branches of nursing, the figure for general nurses qualifying (see table) must be increased as follows:

Add 10% to allow for nurses qualifying on other parts of the Register.

Double the figure so obtained, to include recruits who leave without achieving registration.

This is equivalent to multiplying the figures for general nurses qualifying by 220%, and these estimates of nursing recruits are shown in the table. I have assumed that the wastage-rate is the same for town as for country girls, though there are reasons for believing that it is higher in girls of rural origin. Here again I have adopted the assumption that will tend to minimise the true contrast between town and country. One can therefore regard the last column of the table as an indication that less than 1 girl in every 44 in the large towns of England and Wales, and more than 1 girl in every 18 in the remainder of the country, enter a training school for nurses. Similarly, less than 1 girl in every 36 in the large burghs of Scotland, and more than 1 girl in 14 in the remainder, make an attempt at a nursing career. For Great Britain as a whole the figure is 1 girl in 24.

If one compares the two extremes—the largely rural remainder area of Scotland with the highly urbanised large towns of England and Wales—the relative readiness of girls to enter nursing is in the ratio of 44:14, or more than 3 to 1. The large towns in England and Wales and large burghs of Scotland together contain about three-sevenths of the eligible girls, but they supply less than a quarter of the nurses. Eire sends us a larger proportion of its young women as student nurses than we ourselves supply (about 1 in 20 of its eligible girls), besides presumably obtaining from its native population the vast majority of its own nurses.

It may be asked if 1945 was a typical year. Most of the girls qualifying will have entered training in 1942, when they had the option of nursing as an alternative to the Forces; and it might be that town girls chose the Services more readily than did country girls.

To test this point I made a sample survey of the 1938 Registers for England and Wales and for Scotland, extracting nurses newly registered in 1937. For England and Wales the first entry on each page yielded 199 new registrations, of whom 39 were from the large towns and 160 from the remainder. This gives 80.4% from the remainder against 77.7% in 1945. For Scotland the top three and bottom three entries on each page yielded 115 new registrations, of whom 42 were from the large burghs and 73 from the remainder. The remainder supplied 63.5% in 1937, compared with 65.6% in 1945. The differences are just what one would expect from sampling fluctuations ( $\chi^2=0.77$  and  $0.20$ ).

The war therefore had no significant effect on the proportion of town to country girls among recruits to nursing.

#### DISCUSSION

The statistical analysis brings out two striking facts: (1) the great difference in recruiting-rates between town and country girls; and (2) the high proportion of young women—over 4% in Great Britain as a whole, and over 7% in the rural areas—who start on a nurse's training. It is not generally realised how high is the number of entrants in relation to the total strength of the profession. Wastage is high among trained nurses as well as probationers. The Working Party estimates that the average period of service of a trained nurse in hospital work is only nine or ten years. When the problem of attracting

more recruits is considered in the light of these facts, the following conclusions seem inevitable:

(1) Only a small proportion of girls entering the profession stay in it long enough to aspire to the higher posts. It is highly desirable that the pay and status of matrons and sisters shall be improved, both as a matter of justice and to keep senior trained people from drifting out of the profession. But such measures cannot be expected to have much effect in stimulating the flow of recruits.

(2) Nurses must have special qualities of character and temperament, and it is generally agreed that suitable girls are rather rare. Nobody seems to know exactly how rare. But it seems likely that the contribution of the rural areas of Scotland, 1 girl in 14, is somewhere near the maximum that can be expected. Any attempt to recruit still further from the rural population must surely bring in a predominant number of unsuitable girls.

(3) We are at present recruiting 1 in 24 of eligible girls and we need even more. If half the population were debarred from entrance, the remainder would have to contribute at the very high rate of more than 1 in 12. We must therefore avoid anything that would unduly restrict the field of recruitment. Such restriction may be economic—payment of such low salaries to probationers that girls from poorer homes are discouraged or debarred—or it may be intellectual or educational—the setting of an unnecessarily high minimal standard. The Working Party found that success in nursing had no relation to examination marks or to intelligence-test scores. It would, for example, be hopelessly utopian to demand that all new entrants shall have a school-leaving certificate. To maintain the flow of recruits at its present level we would have to attract about 100% of all girls who obtain such certificates and do not go on to higher forms of education. Moreover, any attempt to turn nursing into a learned profession would at once put it into acute competition with teaching, which now absorbs a large proportion of girls with school-leaving certificates.

(4) It follows that the only possible way of getting more nurses is to increase the recruitment-rate of town girls. At present the proportion of girls from the big cities entering nursing is about a third of that of young women from the country. There is no reason to believe that the incidence of the required qualities of character and temperament is any lower in urban than in rural areas. The number of potential recruits in the towns is adequate to meet all needs. If the intake-rate from the great towns of England and Wales could be raised to that from the remainder, itself largely urban, there would be an increased entry of 32%; and, if all parts of Great Britain contributed as liberally as the remainder of Scotland, the increase would be about 71%. The problem therefore is to discover and eliminate those features of the nursing life that make it specially unattractive to the town girl.

Some clues to the answer are provided by THE LANCET Commission. About 200 young women of good education, in other occupations, were asked for their opinions on nursing. "The great majority feared losing touch with their friends. . . . A nurse tended to drop out of her home circle and that of her schoolfellows. . . . Over half the girls said they could never stand institutional life; it was agreed that after a certain age (variously estimated) a woman must have a place to herself. If strict rules were essential in hospitals, as most were prepared to admit, they held this a good reason for getting away from rules entirely when off duty." Similar objections were made by 60 probationers, all but 3 of whom were glad on the whole that they had taken up nursing. "Nearly two-thirds of the writers complained of the limitation of opportunities for social life and consequent sacrifice of outside interests." A special group of scholarship nurses stated that "the living-in system as applied to nurses

involves a lack of independence to which the modern girl finds it difficult to accommodate herself."

The vast majority of girls of 18-20 want something more than a congenial job with good prospects. They want social life, opportunities for meeting young men, and the chance of a good marriage. To the country girl a nursing training is a way of getting into a big town where there is "more doing." Often she is bitterly disappointed. So far as social contacts are concerned, she would have been better off at home. But to the town girl nursing always means a drastic contraction of her social activities. Even if her home is five minutes' walk from the hospital, she is very largely cut off from her former friends and has no opportunity of enlarging her circle. However much she may be attracted to nursing for its own sake, the sacrifice is only too often more than she is prepared to make.

If this is a true analysis, the remedy is simple. Nurses in training who have parents or close relations within a reasonable distance of the hospital should be given the option of living out and coming into the hospital only when on duty.

I know there are practical objections. Hours of duty would have to be arranged in compact blocks. Adequate boarding-out allowances would have to be paid. There might be travelling difficulties to and from night duties, but these could be met by rest rooms, temporary sleeping-quarters, or special transport. A girl who was serious about nursing would recognise that she could not expect to work office hours and have all her evenings free. But any contention that probationers must be under constant supervision, lest they get into mischief, should be resolutely disregarded. It is this attitude that is keeping some of the most desirable girls out of the profession.

This proposal would help to make nursing much more attractive for the country girl also. Unnecessary rules and restrictions in the nurses' homes would be automatically abolished. It would be impossible to maintain them when some probationers were free to come and go at will. And the country girls would have access to friends and social life in the town via the homes of their town colleagues. I have known of probationers who have never once been invited to a private house in the hospital town during the whole course of their training. If nurses' homes were run as students' hostels, with a fair proportion of the girls living at home, no probationer need complain of lack of social opportunities.

There is another important consideration. Young women are enormously influenced in their choice of a job by the recommendations of their friends. By far the best recruiting agent for the nursing profession is a satisfied nurse. Now, though a considerable proportion of our young women complete their training and stay in the profession, the living-in system and the fact that they are predominantly of country origin drastically limit the number of girls they can influence. My own inquiries indicate that many town girls do not know a single nurse. On the other hand, every girl who gives up nursing is free to dilate on its disadvantages among all her acquaintances. Among the 200 girls questioned by THE LANCET Commission about two-thirds had never seriously thought of taking up nursing; it had never been suggested to them. On the other hand, about 40 said they had been completely "choked off" by stories told them by friends who had taken up nursing. If the student nurse were a familiar figure, moving freely in the community she serves, the ignorance and prejudice would soon be ended.

The abolition of compulsory living-in is not offered as a universal panacea. It in no way alters the arguments for or against other changes, such as better pay and holidays, alterations in the period and character of training, elimination of excessive cleaning and scrubbing, advanced examinations for higher posts, and so on.

But my proposal requires no new buildings or other elaborate preparations, and could be started at once. If it is successful, it should not only bring in more recruits but also reduce wastage by enlarging the social interests of all probationers, including those who live in. If it fails to do this, it could quite easily be discontinued. But there is one very important proviso. Most girls are so strongly prejudiced against nursing that abundant and skilful publicity will be needed to change their attitude. Any reforms must be attractively presented as a "New Deal for Nurses," in such a way as to convince potential recruits that there really are drastic changes. I hope that one or more of the new regional hospital boards will make the experiment.

Whether my practical proposals are accepted or not, the statistical analysis still stands. If we are to have an adequate health service we must get more nurses, and we can only get them by attracting more town girls.

#### SUMMARY

A statistical analysis of the homes of origin of nurses in Great Britain graduating in 1945 shows that recruitment-rates are more than three times as high in the rural areas as in the large towns.

The only feasible way of enlarging our nursing force is to attract more town girls.

It is suggested that this can be done by introducing reforms in nursing conditions, particularly by abolishing compulsory living-in for nurses in training, allowing probationers with parents or near relations living within a reasonable distance of the hospital to live at home.

I wish to thank the Registrars of Nurses for England and Wales and for Scotland for giving me information, and Mrs. W. R. Lord, B.A., Miss Joyce Thomson, and Miss Catherine Paterson for assistance in the tedious work of classification and analysis.

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## REPAIR OF LARGE HERNIÆ WITH TANTALUM GAUZE

### AN EXPERIMENTAL AND CLINICAL STUDY

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THE use of metallic filigrees for reinforcing repairs of large herniæ has been advocated from time to time since its introduction by McGavin (1909). The standard silver filigree, however, has the disadvantage of being comparatively rigid and is not wholly suitable for insertion into the more mobile parts of the trunk. Tantalum gauze, on the other hand, which is woven from tantalum wire of a diameter of 0.075 mm., is sufficiently pliable to adapt itself to the movements of the abdominal wall.

During the last two years investigations have been carried out in this laboratory to attempt to assess the value of this material in the repair of large herniæ. The investigation had two aims—to determine the reaction of living tissue to this material, and to investigate its clinical use.

Sutures\* of tantalum, stainless steel, 'Inconel,' silver, black non-capillary silk, and catgut were implanted into the abdominal wall of 60 rabbits and removed after

\* The silver wire was of pure virgin silver. The stainless steel had the following composition: nickel 18%, chromium 8%, iron 74%. Inconel was composed of nickel 80%, chromium 13%, and iron 7%. The black silk was supplied presterilised by a well-known suture firm; the process of rendering the silk non-capillary is a trade secret.

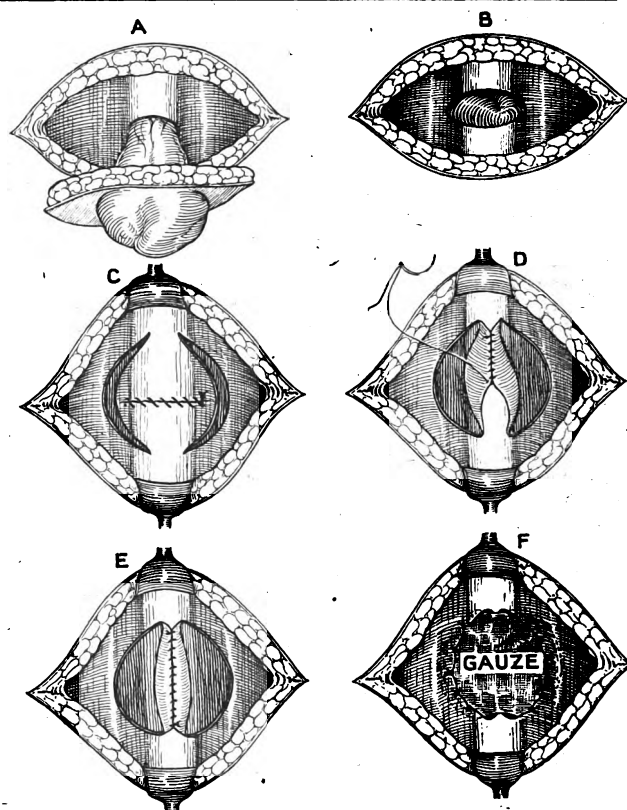


Fig. 1.—Technique of repair of para-umbilical hernia with tantalum gauze.

10–375 days. The tissue reactions round the sutures were examined histologically. Segments of tantalum gauze were substituted for the whole thickness of the abdominal wall of rabbits, and the repair was examined after 175–375 days.

In the clinical field 32 large herniæ have been repaired by the methods illustrated in figs. 1–3.

#### PARA-UMBILICAL HERNIA

The problem here is not that of closing a large defect but of closing a small one in obese patients at a point where the greatest strain is taken by the pull of the abdominal muscles on either side. Functionally the linea alba may be considered as part of the skeleton into which strong muscles are inserted rather than as a soft-tissue structure; it is analogous to the keel of a ship which gives to the hull its main strength and stability. The reconstitution of a strong linea alba appeared to be the main problem in the repair of para-umbilical hernia. This was accomplished by suturing the defect in two layers, the first in a transverse axis, and the second in a vertical axis by turning inwards a flap of the rectus sheath on each side (fig. 1). This left deficiencies in the rectus sheaths into which the tantalum gauze was placed and sutured under the edges of the defect. Finally the latter were brought over the front of the gauze, overlapping it by 0.5 cm., and fixed in that position with interrupted sutures of fine black silk. The deep fascia of the abdominal wall was then sutured superficial to the gauze.

#### INCISIONAL HERNIA

In incisional herniæ much larger defects are present than in para-umbilical herniæ. In one case the defect as palpated through the abdominal wall measured 6 × 12 cm., and in other cases gaps of similar size were present.



Here again an "overlapping" technique was used (fig. 2). After excision of the sac and closure of the peritoneum an incision was made on each side of the defect and the edges of the flap were turned inwards and sutured over the peritoneal suture line. The edges of the resulting defect were then dissected up, and a suitably shaped piece of tantalum gauze was tucked in under them and fixed there with interrupted sutures of fine black non-capillary silk. The margins of the defect were then overlapped in front of the gauze and sutured in that position. Finally the deep fascia was sutured in front of the gauze, and the skin incision was closed.

#### INGUINAL HERNIA

In inguinal herniæ (fig. 3) the problem of filling the defect with tantalum gauze is complicated in males by the emergence of the spermatic cord. If the cord were left in its original position, it would be necessary to make a gap in the gauze to allow the cord to pass through. Such a gap at the very point at which recurrence is likely would weaken the repair considerably.

It was therefore decided to transpose the cord through the fleshy fibres of the internal oblique muscle by bringing the testis out of the scrotum and passing it through the internal oblique muscle about 4 or 5 cm. above its lower margin. It was subsequently found that this manoeuvre had been described by Schmieden in 1934 and later modified by Brandon (1945). The method has been criticised as likely to cause atrophy of the testis or hydrocele of the tunica vaginalis because of dislocation of the testis from its bed. Either of these complications may develop after this operation, just as they may and do develop after difficult operations for recurrent inguinal hernia by any method. Atrophy of the testis must be due to damage to its blood-supply during dissection of an adherent sac from the cord and not to dislocation of the testis from a site from which it receives no blood-supply. Surgeons who have seen scrotal gangrene following extravasation of urine into the perineal pouch will recollect how the testes, lying exposed in the perineum, do not undergo necrosis.

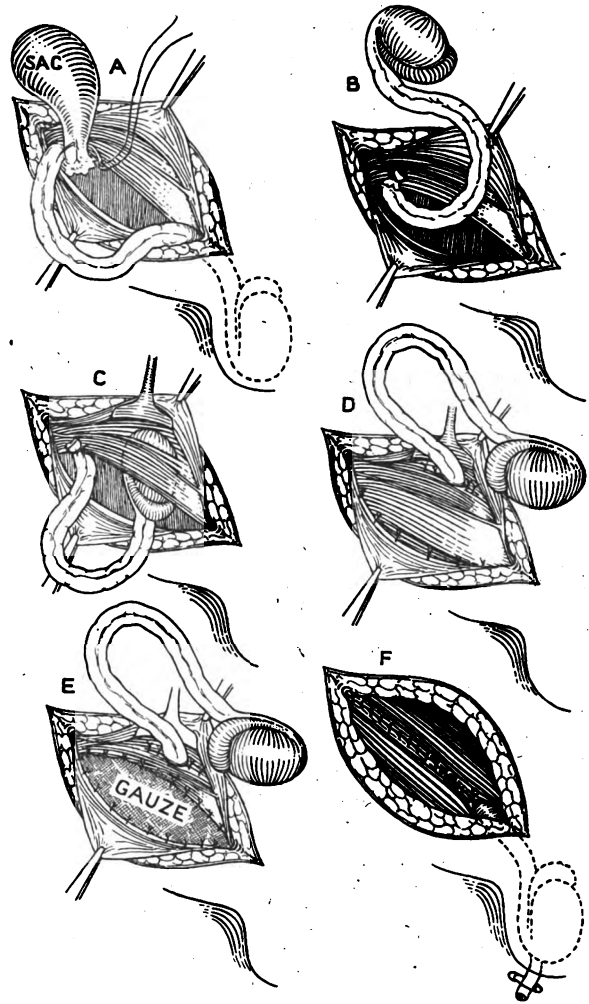


Fig. 3.—Technique of repair of inguinal hernia with tantalum gauze.

The modification of Brandon (1945), which, by division of the muscle at right angles to its fibres and transposition of the cord through the opening thus formed, accomplishes the same object as the Schmieden operation, may be of value in patients who have a strong and thick internal oblique muscle. In these subjects the suture line in the muscle may be expected to heal soundly with little residual weakness.

The case is different in older patients with large scrotal herniæ or recurrent herniæ after a previous Bassini operation. In these cases the lower margin of the internal oblique muscle is not as a rule fleshy but thin and atrophied; to cut across such attenuated fibres is likely to cause serious weakness in the repair. It is with the latter group of cases that this paper is concerned. Time is the true arbiter in this as in all therapeutic measures, but in this series neither testicular atrophy nor hydrocele has been observed up to a year after operation.

The steps in the operation are shown in fig. 3, but the following points are important:

(1) The dissection of the neck of the sac must be very high to allow the stump to retract flush with the peritoneum and to some distance from the spermatic vessels so that a potential sac will not be pulled up to the new point of emergence of the cord.

(2) The mobilisation and delivery of the testis from the scrotum is sometimes difficult, and veins in the tunica and lower end of the cord may bleed. Scrupulous hæmorrhage is essential to avoid a scrotal hæmatoma.

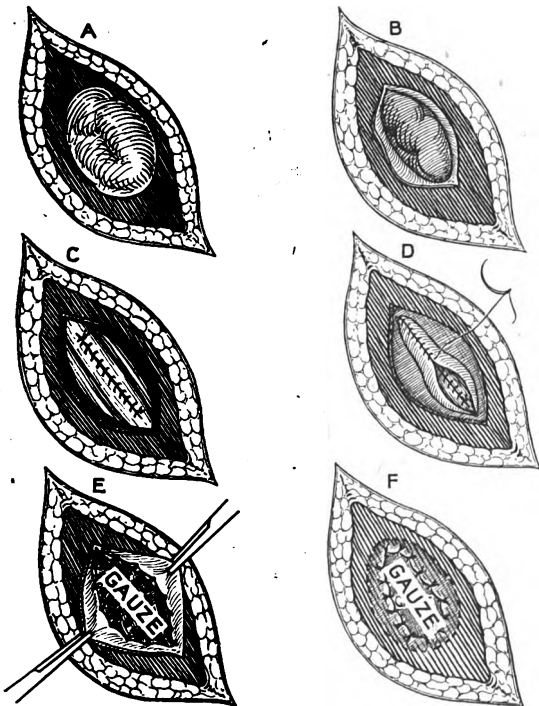


Fig. 2.—Technique of repair of incisional hernia with tantalum gauze.



Fig. 4—Different tissue reactions to two adjacent strands of tantalum in the same animal. ( $\times 30$ .)

(3) Since the margins of the new "internal ring" in the internal oblique are muscular, coughing and straining will tend to narrow the gap and so prevent prolapse of the peritoneum. However, it is wise to make the muscle fit snugly round the emerging cord by the insertion of a few silk sutures.

(4) The internal oblique muscle and the conjoint tendon are brought down to the inguinal ligament as in Bassini's operation, except that the closure is as complete as after orchidectomy.

(5) A suitable piece of tantalum gauze shaped like a half-moon is then fixed over the old inguinal canal with interrupted sutures of fine non-capillary silk or of braided tantalum. The lower end of the gauze is firmly anchored to the periosteum of the upper surface of the pubis, the inferolateral edge to the inguinal ligament, and the superomedial edge to the anterior aspect of the conjoint tendon and internal oblique muscle.

(6) The testis is then replaced. A drainage tube is introduced through the most dependent part of the scrotum. It is true that there may be very little soakage of blood from the drain; but, when this step is omitted, a troublesome hæmatoma requiring subsequent drainage may develop.

(7) The external oblique aponeurosis is then closed in front of the cord in the usual way.

In this operation the inguinal canal is obliterated and the area of the original defect is covered with a layer of tantalum gauze.

#### RESULTS

*Histological Reaction to Tantalum.*—It was soon noted that considerable variation exists from animal to animal in the tissue reaction evoked by the same foreign material. Indeed, strands of the same material in the same animal may produce different tissue reactions (fig. 4). This suggests that factors other than the chemical composition of the suture are involved in the tissue reaction. One such factor is likely to be movement and friction,



Fig. 5—Almost complete absence of tissue reaction round a suture of tantalum which had been in situ for 375 days. ( $\times 30$ .)

though the details of the evidence upon which this statement is based are as yet incomplete. In spite of these variations, however, it was possible to conclude as a result of study of some 600 sections that sutures of tantalum, stainless steel, and inconel are associated with less tissue reaction than are those of silk and of silver. It was impossible to differentiate between the reactions of the tissues to the first three. Sometimes tantalum was associated with virtually no reaction whatever (fig. 5); at other times a considerable response was evoked.

*Condition of Tantalum Gauze after Protracted Implantation.*—When an attempt was made to dissect the gauze from the abdominal wall, it became evident that the connective-tissue fasciculi had grown through the meshes of the gauze in much the same way as the threads of a piece of tapestry are woven through the canvas. It was impossible to separate the gauze from the tissues by dissection; an attempt to do so after boiling the tissue for 48 hours was unsuccessful. After the preparation had been immersed in a 1% solution of pepsin for a week, the connective tissue could be pulled away from the meshes with a pair of fine forceps. The appearance of the gauze had not been changed by its burial in living tissue for over a year; there was no discoloration, and the original "gun-metal" lustre was not dimmed (fig. 6).



Fig. 6—Portion of tantalum gauze which had been buried in the abdominal wall of an animal for 375 days. The connective tissue has been digested off with pepsin. The original "gun-metal" lustre of the tantalum is undimmed.

#### CLINICAL RESULTS

*Immediate.*—These patients appear to have more pain in the first few postoperative days than do those who have had other types of repair. This may be due to the extensive dissection needed to obtain an adequate overlap. Of the 32 wounds, 3 became infected, whereas the others healed by primary union. The infected wounds all healed satisfactorily.

*Late.*—All the patients except one have been personally examined. In this patient an incisional hernia was repaired on Nov. 1, 1946. Three months later she had a sudden cerebral thrombosis from which she died in Edinburgh Royal Infirmary. All the other patients are in good health and have no complaints referable to the operation. The scars are soundly healed, soft, and mobile, and the hernia has not recurred in any case. In one patient there is still a diffuse bulge in the lower abdomen, but no defect in the abdominal wall can now be detected. The bulge is taken to be due to paralysis of the lower half of the right rectus muscle which followed injury to the 11th and 12th intercostal nerves during the original appendicectomy, performed through Battle's incision.

#### COMMENT ON THE CLINICAL WORK

The presence of the gauze does not incommode the patients, and their tissues appear to tolerate it well for eighteen months.

On examination of the scars a year after operation it is not as a rule possible to tell that the gauze is present. The tissue underlying the scar is thickened and firmer

than the surrounding area, but otherwise nothing abnormal can be detected.

In other situations the use of solid sheets of tantalum immediately under the skin is apparently not free from disadvantages; though it is difficult to find published confirmation of this. If a large bulk of metal lies subcutaneously its reaction to heat and cold will be different from that of the adjacent tissues, and this may lead the tissues to exclude it. If a smaller amount of the material is buried more deeply, such physical effects may not occur.

The following general technical points are perhaps worth mentioning. The gauze is sterilised by autoclaving, though it may be repeatedly boiled without deterioration. No-touch technique has not been used in this series, because it is necessary to keep palpating the edges of the defect to be certain the gauze is being fixed to strong healthy tissue. Penicillin in doses of 250,000 units eight-hourly is given postoperatively in conjunction with supervised breathing exercises to prevent pulmonary complications.

Whether or not the use of the tantalum gauze inlay is a better method for counteracting the deficiency of tissue than are the other methods at present available is a matter to be decided by careful follow-up studies. Each of the standard methods has its drawbacks: fascia has to be removed from the thigh, and the needles used for its insertion may damage adjacent tissues; sinuses may develop with the use of silk or of nylon; and it is difficult to sterilise a skin graft. No doubt undesirable features will become evident with the use of tantalum gauze, but the early results are sufficiently encouraging to warrant further clinical trial.

#### SUMMARY

An experimental and clinical study of the use of tantalum gauze in the repair of defects in the abdominal wall is reported.

It was found difficult to compare the tissue reactions to various suture materials because of the variation in response from animal to animal. Even strands of the same material in the same animal may evoke different tissue reactions. Factors other than the chemical and physical nature of the suture are probably involved in tissue reactions.

Sutures of tantalum, stainless steel, and inconel are on the whole associated with less tissue reaction than those of silk or of silver, but the difference is not striking. No difference could be detected in the tissue reactions to the first three materials.

In 32 herniæ repaired with tantalum gauze, the immediate results were satisfactory.

I am indebted to Messrs. Johnson & Johnson Ltd., of Slough, for supplying tantalum wire and gauze for experimental and clinical trial; and to Messrs. Down Bros., of London, for the specimens of silver, stainless steel, and inconel which were studied.

This work was begun in the Postgraduate Medical School of London, and the expenses incurred there were partly defrayed by a grant from the Central Research Fund of the University of London.

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## LEUKÆMIA PRESENTING WITH NEUROLOGICAL MANIFESTATIONS

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NEUROLOGICAL complications are not uncommon in leukæmia and occur with about equal frequency in the acute and chronic forms and in the various types. Schwab and Weiss (1935) found that neurological signs were present in 20.5% of 334 cases, and they excluded retinal lesions in these figures. It is unusual, however, for neurological manifestations to provide the initial signs.

Munro (1920) described a patient with acute myelogenous leukæmia presenting as meningitis, and Blaschy (1929) a patient with pain and paralysis of both legs subsequently proved to have chronic lymphatic leukæmia. Critchley and Greenfield (1930) described 3 cases of chloroma in which the early manifestations were (1) backache with numbness and weakness of legs, retention of urine, and exophthalmos; (2) abdominal pain, complete left facial palsy, retention of urine, and late flaccid paralysis of lower limbs; and (3) weakness and numbness of legs with difficulty in passing urine. Haintz (1933) published a case of acute myelogenous leukemia in which the initial symptoms were inability to micturate, incontinence of feces, and impairment of vision and hearing. Garvey and Lawrence (1933) collected 3 cases of acute lymphatic leukæmia beginning with facial paralysis (in one case bilateral with involvement of taste fibres), and Schwab and Weiss (1935) a similar case of unilateral facial paralysis accompanied by difficulty in swallowing. Of 14 cases of leukæmia with post-mortem evidence of neurological complications, published by Diamond (1934), 4 presented with pain and paralysis resulting from lesions of cranial or peripheral nerves.

In the following 3 cases the initial clinical picture was that of a neurological disorder.

#### CASE-RECORDS

**Case 1.**—A boy, aged 14, was admitted to Aberdeen Royal Infirmary on Sept. 9, 1935, with lumbar pain radiating down right leg and with six weeks' history of difficulty in micturition. At onset the lumbar pain was relieved by sitting up. It was not till a week later that the pain involved right leg and foot, so severely that patient could only get about with extreme difficulty. He was confined to bed for three weeks without much improvement. During this time he developed difficulty in passing urine, and eventually, owing to bladder distension, catheterisation became necessary. Weakness of left face and deafness came on, and the boy was sent to hospital.

**Examination.**—General condition poor; patient pale and thin. Intermittent fever with tachycardia. Throat, mouth, tongue, teeth, heart, lungs, and blood-pressure normal. No palpable lymph-nodes. Liver and spleen not enlarged. Left facial paralysis of lower-motor-neurone type, with nerve deafness on same side, but not affecting taste. Cranial nerves otherwise intact. Upper limbs normal. No sensory loss on trunk. All abdominal reflexes absent. Flaccid paralysis of both legs, with diminished knee-jerks, absent ankle-jerks, and bilateral extensor plantar responses. Sensation to cotton-wool and pinprick much reduced on lateral aspect of both legs. Sensation of passive movement absent on both sides. Tenderness on pressure of calf muscles and tendo Achillis.

**Investigations.**—Cerebrospinal fluid (c.s.f.): Froin syndrome: protein 800 mg. per 100 ml.; Wassermann and colloidal-gold reactions negative. Urine: albumin present; no sugar; deposit showed many pus cells and motile bacilli. Blood: Hb 38%; red cells 1,900,000 per c.mm., colour-index 1.0; white cells 58,200 per c.mm.—myeloblasts 90–95%.

**Progress.**—Suprapubic cystostomy performed on admission. By Sept. 14 patient had developed right facial palsy of lower-motor-neurone type, and all reflexes in lower limbs were absent. Sensory loss up to T12. Condition unchanged until Oct. 7, when œdema of both legs and sacral region became manifest. About this time also there was clinical evidence of left-sided pleural effusion, and retinal hæmorrhages appeared. During these weeks patient ran an intermittent fever and

"... We need to remember that history is a matter of sense as well as of science, and of feeling as well as of fact. ... We cannot understand why men acted in a certain manner unless we know how they felt; and in discovering where men failed in sympathy and understanding because of such ignorance, we come to the realities of history and indeed of politics... upon which not merely good citizenship but also good management and administration, and indeed the organisation to serve a new world order, must be based.—*Nature*, June 5, p. 867.

went steadily downhill until his death on Oct. 19. Necropsy not permitted.

*Diagnosis.*—Acute myeloblastic leukaemia.

**Case 2.**—A male, aged 19, first complained of backache on Oct. 17, 1945. He continued to work as a farm servant until Oct. 21, 1945, when he had to stop owing to severe lumbar pain. He stayed in bed for some 10 days without improvement, and for 4 days before admission he could not lie flat because of pain. He was admitted to Aberdeen Royal Infirmary on Oct. 31, 1945.

Previously he had been fit and well, and his family history was negative apart from his mother's death 10 years earlier from pulmonary tuberculosis.

*Examination.*—A well-built healthy-looking young man obviously in severe pain. Heart, lungs, and blood-pressure normal; liver, spleen, and lymph-nodes not enlarged. Central nervous system showed no abnormality. Thoracic vertebrae 10 and 11 somewhat protuberant, painful, and tender. Flexion of neck caused pain in thoracic spine.

*Investigations.*—Radiography: spine and chest normal. c.s.f.: Queckenstedt normal response; protein 200 mg. per 100 ml.; cells 12 per c.mm. (lymphocytes); chlorides 701 mg. per 100 ml.; globulin present; Wassermann reaction negative.

Blood: Hb 86%; red cells 4,280,000 per c.mm.; colour-index 1.0; erythrocyte-sedimentation rate 20 mm. in 1 hour; white cells 40,700 per c.mm.—neutrophil polymorphs 32% (non-segmented 15%, segmented 17%), premyelocytes 2%, myelocytes 8%, eosinophils 3%, basophils 0%, lymphocytes 6%, monocytes 5%, atypical cells 44%. A film revealed one normoblast per 100 white cells. Atypical cells had a clear blue non-granular cytoplasm, and cells varied considerably in size. Nuclei were often indented or irregular, and nuclear chromatin was arranged as a fine network. Nuclei showed 2-5 nucleoli, and vacuolation of nucleus and cytoplasm was common. No pseudopodia seen.

*Sternal puncture:* normal marrow cells replaced almost entirely by atypical cells whose characteristics were the same as those in the film.

*Progress.*—Repeated blood examinations showed a rising white-cell count with a progressive increase in atypical cells and slow fall in amount of haemoglobin and red cells.

On the day after admission patient developed retention of urine, and a week later gradually increasing weakness of the legs—flaccid paralysis with loss of knee and ankle jerks. Sensory loss to cotton-wool and pinprick corresponded to L4 and L5, with in addition a butterfly area on buttocks. These signs persisted.

Suprapubic cystostomy performed on Nov. 12, about which time patient developed bedsores over sacrum. By Nov. 17 axillary lymph-nodes were enlarged, firm but not tender, and spleen palpable to 1 finger-breadth below left costal margin.

Soon afterwards patient developed swinging fever with profuse sweating and tachycardia. Icterus appeared, and skin showed numerous petechial haemorrhages. Gaseous crepitus developed on Nov. 20, first in region of bedsores, which was now foul-smelling and black, and later in legs and trunk. Patient's condition rapidly deteriorated and he died on Nov. 21.

*Necropsy.*—All tissues, including central nervous system, grossly oedematous, discoloured, and aerated with crepitant bubbles of gas, preventing adequate histological examination. Spinal cord and meninges showed no detectable lesion apart from those associated with the anaerobic septicæmia. Cord was cut every 1 cm., and no gross haemorrhagic lesion was detected.

*Diagnosis.*—The atypical white cells might be regarded as immature monocytes and the leukaemia therefore as of acute monoblastic type. On the other hand, no forms intermediate between the immature cells and monocytes were seen, and accordingly an undifferentiated leukaemic reticulosis is probably to be preferred as the diagnosis.

**Case 3.**—A male, aged 45, was admitted to Aberdeen Royal Infirmary on Aug. 28, 1946, with five months' history of pain in right knee, which was worse at night and not affected by movement. Otherwise he felt quite fit at time of onset.

Six weeks before admission he had developed sudden lumbar pain, which though present when he was lying or sitting, became severe only on movement. Despite physiotherapy, the condition did not improve and gradually the pain extended to his thigh. During these weeks patient noted

numbness and pins-and-needles in right toes. He was losing weight. No urinary or bowel upset, and his previous and family histories revealed nothing of significance.

*Examination.*—Pale and thin. Blood-pressure 125/85. Mouth, heart, and lungs normal. Enlarged discrete nodes, not tender, palpable in axillæ and groins. Liver enlarged to 2 finger-breadths below right costal margin. Spleen not enlarged. Small hydrocele on right side. Cranial nerves, upper limbs, and trunk normal. Loss of power of all muscle groups of right leg, diminished knee-jerks, absent ankle-jerks. Plantar responses flexor. Zone of hyperæsthesia to pinprick over dorsums of right toes and sole of right foot; otherwise sensation unimpaired in both legs. Wasting of right thigh, which measured 12½ in. at its maximum compared with 13¾ in. of left thigh. Some pitting oedema over right iliac crest posteriorly.

*Investigations.*—Radiography: pelvis, right femur, thoracic and lumbar spine, and chest normal. c.s.f.: Queckenstedt normal response; protein 500 mg. per 100 ml.; no increase in cells: globulin ++; Wassermann and colloidal-gold reactions negative.

Blood: Hb 78%; red cells 3,980,000 per c.mm.; platelets 225,000 per c.mm.; white cells 93,400 per c.mm.—blast cells 7.5%, premyelocytes 6%, myelocytes 14.5%, neutrophil polymorphs 54.5% (non-segmented 16.5%, segmented 38%), eosinophils 5%, basophils 1.5%, lymphocytes 4%, monocytes 7%. On blood film red cells were mainly normal, but some were microcytic and hypochromic. Wassermann reaction negative. Blood-urea 68 mg. per 100 ml.

Urine: sp. gr. 1.026; albumin trace; no sugar; a few pus cells in deposit.

*Progress.*—Patient was treated with generalised deep X-ray therapy, which was continued despite development of extensive oedema (affecting both legs, thighs, back, genitalia, right flank, and abdominal wall) and right pleural effusion. This subsided a little, and patient was discharged home as a bed-patient on Nov. 15 with a white-cell count of 3000 per c.mm. He reported as an outpatient on Dec. 5, by which time he felt somewhat better. There were no signs of oedema though there was still fluid in the right pleural cavity. Despite the improvement he was still unable to get about. The right plantar was now extensor; and apart from the sensory signs which had cleared up earlier the neurological examination was unchanged. Haemoglobin 84%; white cells 26,700 per c.mm. Spleen still not palpable. The patient died at home about two weeks later.

*Diagnosis.*—Chronic myelogenous leukaemia.

DISCUSSION

*Pathogenesis*

Schwab and Weiss (1935) analysed the neurological symptoms and signs of 69 cases of leukaemia from three Boston hospitals as follows:

Manifestations	No. of cases
Cranial-nerve palsies and anaesthesia	21
Absent reflexes	13
Pyramidal signs	8
Paræsthesia	10
Herpes	4
Meningeal signs	5
Miscellaneous (coma, paralysis, tremors)	8

The clinical manifestations of leukaemic involvement of the central nervous system may be due to various causes.

(1) There may be infiltration of the brain or cord by localised or diffuse leukaemic deposits. These are usually surrounded by haemorrhages, which may overshadow the deposits (Diamond 1934). This type of lesion was present in two of the cases reported by Diamond and in that described by Schwab and Weiss (1935).

(2) Areas of softening due to thrombosis or some such vascular upset may be found. The vessels of the brain or cord are often packed with leukaemic elements, and this may readily lead to thrombosis.

(3) Gross intracerebral, subdural, or subarachnoid haemorrhage has been found in such cases but is apparently rare.

(4) The meninges may be infiltrated by leukaemic deposits. According to Critchley and Greenfield (1930) this is the commonest pathological finding. Diamond (1934) states that it is present to a greater or lesser degree in all such cases.

(5) Infiltration of the nerve-roots or peripheral nerves may occur. Garvey and Lawrence (1933) reported this type of

lesion in three cases of facial paralysis associated with leukaemia. Combination of these lesions are often found.

Necropsy was done in only one of the present cases, and no definite conclusions could be reached, owing to the profound changes caused by the complicating anaerobic septicæmia. In these circumstances the pathological cause of the neurological signs and symptoms can only be surmised. The progressive march of symptoms in each case suggests that compression of the cord played a large part in the clinical manifestations, and the high protein content of the c.s.f. supports this. Leukaemic deposits in the meninges are the most likely cause of this compression. Part of the syndrome was possibly due to ischaemic softening of the cord by thrombosis.

#### Symptoms

Review of these cases brings out the following points, all of which are substantially corroborated by previously published reports.

The incidence of this condition falls on a young age-group: two of the patients were under 20, and the other was 45. In all three cases the earliest complaint was pain. In the first case the pain radiated from the lumbar region into the leg, leading to a provisional diagnosis of sciatica. In case 2 the pain remained localised to the lumbar region. The third patient first complained of pain in the right knee and only later of pain in the back, radiating into the thigh. In all the pain was intractable and resistant to physiotherapy, and tended to become progressively more severe. Paræsthesiæ, such as numbness and pins-and-needles, were never noted as initial symptoms.

The course of the illness was progressive. Shortly after the onset, but at various intervals, the patients developed persistent weakness of the leg or legs. Retention of urine occurred in cases 1 and 2 at about the same time as the paraplegia developed. Pitting œdema was seen in cases 1 and 3, beginning over the sacral region and spreading to involve the legs, abdominal wall, and even the pleural cavities. Case 2 had a bed sore early in the disease; according to the literature this happens all too often in this type of case.

The physical signs of neurological disturbance associated with leukaemia have no characteristic features. A high protein content in the c.s.f. was found in every instance, but no other abnormality. Several workers have claimed the finding of immature white cells under such conditions, but these were not found in the present series.

The usual clinical picture of leukaemia with splenomegaly, hepatomegaly, and adenopathy was never complete. Case 1 showed none of these features at any stage. In case 2 mild splenic and glandular enlargement appeared late, and in case 3 hepatomegaly was present at the onset, with some glandular involvement later. Clinical evidence of leukaemia may therefore be absent or only minimal.

In a young person the occurrence of intractable back and leg pain followed by weakness of the legs (with possibly retention of urine) of obscure ætiology should call for a complete blood examination to exclude leukaemia or an allied disorder.

It is a pleasure to thank Dr. A. G. Anderson, Mr. Alex. Mitchell, and Dr. John Craig for permission to publish cases 1, 2, and 3 respectively. I am greatly indebted to Prof. L. S. P. Davidson for the blood picture in case 1, to Dr. H. W. Fullerton for the hæmatological investigations in cases 2 and 3 and for helpful criticism and to Dr. C. E. Lumsden for the necropsy findings.

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## HOMOLOGOUS SERUM HEPATITIS

REVIEW OF 216 CASES

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THE Polish Venereal Diseases Treatment Centre in Germany started its work on July 12, 1945, and up to July, 1946, it had dealt with 1300 cases of early syphilis, all treated with 2,400,000 or 4,000,000 units of penicillin alone without arsenic or bismuth. Since there were 15% of relapses, the B.A.O.R. scheme of treatment was then introduced, which consisted of 4,000,000 units of penicillin plus one course of neoarsphenamine and bismuth (ten weekly injections of 0.6 g. and 0.2 g. respectively). This scheme started in July, 1946, and the number of patients attending each day for injections increased rapidly to 70-80.

When I was put in charge of the syphilis department at the beginning of November, 1946, I was confronted with a violent epidemic of hepatitis. In the preceding month 52 patients had developed hepatitis, 8 of them dying of acute yellow atrophy of the liver. Suspecting that the hepatitis was due to syringe transmission of an infective agent, I took the following precautions to prevent further spread:

Two orderlies dealt with the syringes. One took the syringe after the injection of neoarsphenamine, washed it under running water and next with soap and water, put it into distilled water for 3 min., immersed it in 2% solution of eusol or 5% carbolic acid, washed it again under running water, and finally put the syringe and needle into the steriliser, where it remained in boiling water 20 min. Later, a second orderly, called the "clean orderly," took out the syringe, filled it with neoarsphenamine solution, and handed it to me for the next injection. This method corresponds approximately to the one called by Laird (1946) the "Preston technique."

This method of sterilisation was first applied in the Polish V.D.T.C. on Nov. 12, 1946, from which date till June 1, 1947, 766 patients were treated for primary or secondary syphilis. Of these 766 patients 184 had part of their treatment under the old conditions.

#### EPIDEMIOLOGY

The epidemic of hepatitis developed as follows:

Month	No. of cases of hepatitis	Deaths
October, 1946	52	9
November, 1946	45	6
December, 1946	49	14
January, 1947	23	2
February, 1947	23	5
March, 1947	14	3
April, 1947	14	1
May, 1947	6	0
Total	226	40

The precautions in sterilisation of syringes applied only to arsenic and bismuth injections and not to routine blood tests after gonorrhœa and syphilis until March 1, 1947.

It was reasonable to expect a diminution or extinction of homologous serum hepatitis only in patients who had their whole course of injections administered with syringes and needles sterilised by the new method. Even one injection by the old method might have transmitted the virus of homologous serum hepatitis.

Since the incubation period of homologous serum hepatitis is known to be 60-120 days (in my experience even 150 days), it was expected that the epidemic would start to diminish two months later. It could have been completely extinguished 120-150 days after Nov. 12, 1946, as the following events show.

From January, 1947, onwards there were distinctly fewer cases of homologous serum hepatitis. Of the 23 patients with hepatitis observed during this month 12 had had no arsenical treatment, but all had had a blood test three months before the onset of hepatitis, 8 had had some injections before Nov. 12, 1946, 2 had had all their treatment in another hospital, and 1 developed hepatitis after three injections. The last cannot be considered a case of homologous serum hepatitis; it was obviously a case of arsenical intoxication.

In February there was a similar picture: of the 23 cases observed, 10 arose three months after routine blood tests in patients who had had no arsenic, 5 were in patients who had had part of their treatment before Nov. 12, 1947, and 8 in patients who had had part of their treatment in other hospitals.

March and April show an almost identical picture. In May there were only 6 cases of hepatitis: 4 in patients who had only had blood tests; 1 in a patient who had had three injections in another hospital; and the sixth seemed to be a case of arsenical intoxication, since the patient developed jaundice on the ninth day of treatment.

Since the proper sterilisation of needles and syringes for routine blood tests after gonorrhoea was introduced only on March 1, 1947, it was not surprising to see such a high incidence of hepatitis in this group who had not had arsenic. This delay was not purposely designed to afford proof of syringe-transmission of hepatitis but was due to the fact that routine blood tests after gonorrhoea and syphilis were performed in the gonorrhoea department, which was separate from the syphilis treatment centre.

The average age of the patients was 30 years. There were 224 men to 2 women. There was a previous history of hepatitis in 12 patients.

*Incubation Period.*—The average incubation period was 90 days. It is difficult to calculate the incubation period of hepatitis after arsenical injections. A course of ten injections of neoarsphenamine, one injection every 7 days, covers 63 days. The injection which transmitted the hepatitis might have been any one of them. Consequently any calculation based on cases treated with arsenic will give a margin of error of 63 days. Some patients developed hepatitis 60 days after the first injection and 3 days before the last. Others developed it 166 days after the first injection and 103 days after the last. Much more precise is the calculation based on cases of hepatitis transmitted during blood tests. In many cases there was only one blood test, and in those there can be no mistake whatever about the incubation period. The average incubation period based on those cases is 90 days. The shortest period was 55 days and the longest 150 days.

*Previous Food Intake of Patients.*—During the two years preceding the epidemic the patients' diet was more than adequate. The basic ration, which amounted to 3500 calories daily, was supplemented by purchases in the unit canteens and in the black market, where cigarettes were exchanged for eggs and butter. During these two years I did not see a single case of undernourishment; even in the necropsy reports there was usually the phrase "Well-fed subject."

#### ETIOLOGY

"Postarsphenamine jaundice" has always been a common incident during antiluetic treatment. In general the incidence has been highest in clinics where a great number of patients are treated. It has been particularly high in Army clinics. Infective and homologous serum jaundice were among the most important causes of morbidity among troops of all branches of military services during the late war.

In considering postarsphenamine hepatitis one has to make a clear distinction between the early and the late

varieties. The early variety appears about 9–12 days after the beginning of treatment. It seems reasonable to exclude virus as an aetiological factor and to consider this type of hepatitis as an arsenical intoxication. This point of view is corroborated by the fact that this early hepatitis is often associated with erythema on the 9th day, and in 40% of all erythemas observed in this treatment centre liver-function tests have demonstrated some damage to the liver.

So far as late postarsphenamine hepatitis is concerned (60–150 days after the first or last arsenical injection), it is difficult not to accept as its causal agent the virus of homologous serum hepatitis transmitted by insufficiently sterilised syringes.

Milian (1920) considered postarsphenamine hepatitis as being due to syphilis. This hypothesis cannot explain the cases of hepatitis occurring in non-syphilitic patients 100 days after a blood test. If Milian's theory was correct, the best treatment for hepatitis during arsenical treatment would be to continue arsenic. This procedure is shown by clinical and biochemical observations to be unsafe (Marshall 1946).

In a recent study of liver function it has been demonstrated on 49 patients that massive arsenotherapy for syphilis (1200 mg. of 'Mapharside' in five days) does not impair the liver function; even the most sensitive tests are unable to demonstrate the slightest evidence of liver damage (Lawrence and Olanski 1946).

Observation of the present series of 226 cases suggests that though arsenic may not have any toxic action on a sound liver it has an influence on liver already damaged by hepatitis in worsening the condition of the patient or even causing death. The following figures illustrate this point: of the 226 patients with hepatitis 96 had had no arsenic (they had only had routine blood tests three months after gonorrhoea); 120 had had arsenic. (The remaining 10 cases seem to be toxic hepatitis.)

The clinical picture of the 120 patients treated with neoarsphenamine was very severe, and 30.8% of them died. Of the 96 patients who had had no arsenic, though the source of infection was the same, only 3 died, and the illness of the remaining 93 patients took a milder course. This suggests that arsenic administered to patients during the incubation period of hepatitis has a damaging effect on the liver.

Many studies have been made of the influence of dietary protein deficiency on hepatitis (Beattie and Marshall 1944, Himsworth and Glynn 1944, Marshall 1944). It seems difficult to incriminate any dietary deficiency as a causal agent in the present series of 226 cases of hepatitis, because, as I mentioned before, they were all very well nourished, with a rich intake of proteins.

#### CLINICAL PICTURE

The clinical picture varied in the 226 cases of hepatitis but can be divided into two types: (1) pyrexial (70%); and (2) gastro-intestinal (30%). Case 1 is an example of the first type.

**Case 1.**—Syphilis was diagnosed in July, 1946, and treatment started immediately. The tenth and last injection of neoarsphenamine and bismuth was given on Sept. 7, 1946. On Dec. 18, 1946, patient reported to the V.D.T.C. with two days' history of a violent headache, temperature 100°F, pulse-rate 72, respirations 20 per min., and liver slightly enlarged and tender. White-cell count 4000 per c.mm.; red cells 4,500,000 per c.mm. In the evening of the same day the temperature rose to 102°F, and the patient complained of persistent headache. Next day temperature rose from 103°F in the morning to 104°F in the evening.

During the first days of observation the prominent features were high temperature and violent headache. On the fourth day patient became so agitated and violent that it was difficult to keep him in bed. Periods of excitement alternated with periods of deep depression. On the fifth day his temperature dropped from 104°F to normal, and he showed the first

signs of jaundice. White-cell count 12,000 per c.mm., red cells 4,200,000 per c.mm. The same day the patient went into coma, his breathing became stertorous, and there was profuse bleeding from mucosæ. He died the same evening.

Case 2 is typical of the gastro-intestinal variety.

**Case 2.**—Early syphilis was diagnosed in August, 1946. On Aug. 7, 1946, the patient received his first injections of neoarsphenamine and bismuth at the end of his course of 2,400,000 units of penicillin. His last injections of arsenic and bismuth were given on Oct. 10, 1946.

On Oct. 23, 1946, he reported to his unit m.o. with anorexia, pain in right upper quadrant of abdomen, and general malaise. He was kept in his unit sick-bay, where he received a mild laxative and was put on a fluid diet. He did not improve, vomited twice on Oct. 24 and 25, and complained of general weakness and headache. No fever; pulse-rate 72 per min.

On Oct. 26, 1946, the patient was brought to No. 10 Light Field Ambulance. By then he had slightly jaundiced conjunctivæ, a tender and palpable liver, and dark urine containing urobilinogen (strongly positive test) and bile pigments (positive test). He was prostrated, complaining of general weakness, discomfort, and headache. The same day he was sent to a British General Hospital with a diagnosis of infective hepatitis. There he was put on a saline-glucose drip and received sodium bicarbonate for alkalinisation. In the evening he was semiconscious, became very agitated, and vomited. Next day, Oct. 27, he went into coma, and he died early in the morning of Oct. 28.

Sometimes the clinical picture is most misleading, as in the following case.

**Case 3.**—On Dec. 10, 1946, a man reported sick with headache and feverishness. His m.o. examined him and did not find any physical signs, but in view of his temperature (100°F) kept him in bed and gave him aspirin. The diagnosis was mild influenza.

Next day the patient did not feel any better; his temperature rose from 101°F in the morning to 102°F in the evening. He complained only of headache. On Dec. 12 his temperature was 103°F in the morning and 104°F in the evening. The m.o. could not find any abdominal or respiratory signs. The patient was then given 200,000 units of penicillin (ten injections each of 20,000 units), but there was not the slightest improvement.

On the morning of Dec. 13 his temperature was still 104°F, pulse-rate 80 per min., red cells 4,500,000, white cells 3500 per c.mm. He was prostrated, still with the same symptoms. The gradual daily increase of fever and its persistence without remission once it had reached 104°F, the leucopenia, the history of epistaxis seven days before the onset of the disease, some small pharyngeal ulcerations, a dicrotic pulse, the general stupor, and a tongue which was white in the middle and reddish-brown on the border (*langue rôtie* of the French) led to the diagnosis of typhoid fever. When the m.o. came to the hospital to inquire about his patient, he was told, "It is a classical textbook case of typhoid fever. We are waiting for the result of the blood-culture and Widal reaction."

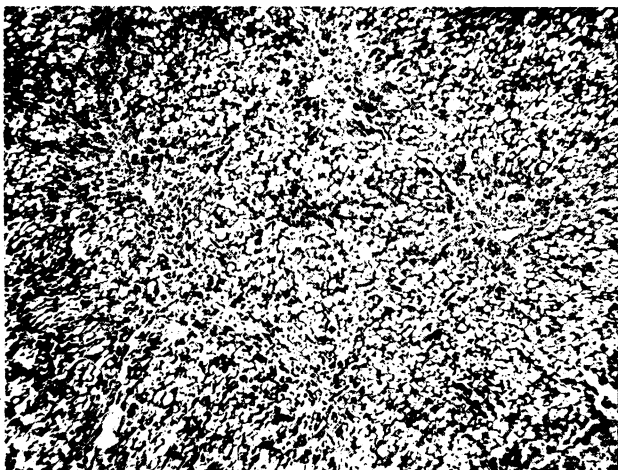


Fig. 1.—Acute necrosis of liver produced experimentally in rabbit.

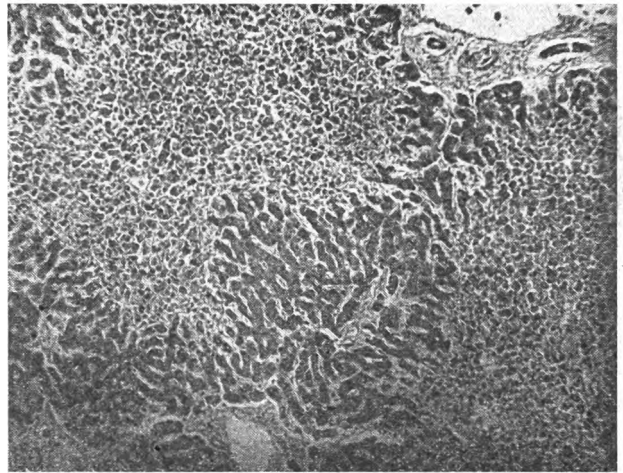


Fig. 2.—Acute necrosis of liver in man.

Next day jaundice appeared, and 24 hours later the patient died of acute yellow atrophy of the liver.

This incident illustrates how misleading may be the symptoms of the pre-icteric phase of homologous serum jaundice. Schiff (1946) writes: "The diagnoses most frequently considered during the pre-icteric phase are malaria, sand-fly fever, atypical pneumonia, upper respiratory infections, and infectious mononucleosis."

In diagnosis during the pre-icteric phase of most of the 226 cases of homologous serum hepatitis the most useful and constant test has been the examination of the urine for urobilinogen with Ehrlich's reagent. This test has been positive in many cases as long as 14 days before the appearance of icterus.

#### TRANSMISSION TO RABBIT

On Jan. 24, 1947, I injected a rabbit intravenously with 1 ml. of blood-serum from one of the men who died of acute yellow atrophy of the liver after a short illness. I immediately sterilised the same syringe and needle by boiling for 20 min. and injected with it 1 ml. of distilled water into a second rabbit. (The limited number of rabbits used is explained by the fact that it was very difficult to obtain those animals.) The two rabbits were kept in cages and fed normally, in the same way as they are fed by farmers.

During the first seven weeks the two rabbits took their food well and were becoming fat. During the last week of the second month rabbit no. 1 was taking less food, and exactly two months after the inoculation the rabbit died.

At necropsy the conjunctivæ were slightly jaundiced. The skin, when taken off the body, showed a distinct yellow tinge. The lungs were congested and œdematous, with subpleural effusions. The kidneys were swollen and congested. The liver showed microscopical changes (fig. 1) similar to those seen in the livers of the human subjects who died of acute necrosis after homologous serum hepatitis (fig. 2). It had the same mottled appearance with dark red and yellowish areas, and was soft and fragile to the touch. Microscopically it can be seen that there was an acute necrosis of the liver: necrosis of the liver cells, lymphocytic infiltration, and disorganisation of the normal liver structure. The vacuoles are due to the fact that the liver was fixed 30 hours after the death of the rabbit.

Rabbit no. 2 is still alive 130 days after the injection described above.

Further investigation on the possibilities of transmission of homologous serum hepatitis to rabbits and the use of the complement-fixation reaction are in progress.

## SUMMARY

A series of 226 cases of hepatitis arising in patients under treatment for venereal disease is reviewed.

Of the 226 cases 10 are excluded as not being due to a syringe-transmitted virus.

Syringes and needles washed in water, kept 3 min. in 5% carbolic acid or eusol 2% and then boiled 20 min. can be considered to be completely sterilised and free from contamination with the virus of hepatitis.

Homologous serum hepatitis is apparently transmitted by inoculation of an infective agent into the blood-stream at injection or blood test.

Homologous serum hepatitis is an infective disease due to a virus. Arsenic and protein deficiency may have a secondary effect in worsening the condition of the patient, but they cannot be incriminated as causal agents.

Homologous serum hepatitis is transmissible to rabbits.

I wish to thank Dr. M. Przedborski, then commanding officer of the Polish V.D.T.C., for facilitating my work, and for his keen interest and encouragement; and Dr. J. Marshall for help, advice, and encouragement in the preparation of this article.

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## CHORIONEPITHELIOMA TREATED WITH STILBŒSTROL

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THE treatment of malignant tumours, especially prostatic cancer, with oestrogens has met with some success, and it is well known that oestrogens counteract the increased production of gonadotrophic hormone after castration or during the menopause. It was therefore decided at the Jubilee Clinic, Lund, to treat a chorionepithelioma with stilbœstrol in the hope that it would reduce the circulating hormones and inhibit the growth of the tumour cells.

A woman, aged 20, had already had two normal confinements. In December, 1944, at her local hospital, she had spontaneously expelled a hydatid mole. Subsequently she had had irregular metrorrhagia, for which she had been readmitted in November, 1945. Curettage had revealed endometritis and decidual remains. Curettage had again been performed in January, May, and June, 1946. On the first two occasions no microscopical examination had been made, but chorionepithelioma had been diagnosed histologically in June, and the patient was admitted to the Jubilee Clinic on July 16, 1946.

*On admission:* uterus enlarged to about 3 inches in diameter, with an even surface, and of a uniformly soft consistence; radiography of lungs showed very small metastases (diagnosed later); pregnancy test positive; and gonadotrophic-hormone level in urine 333-4200 mouse units (m.u.) per litre.

*Operation (July 27).*—Total abdominal hysterectomy and bilateral salpingo-oophorectomy performed at Department of Gynaecology, Lund. Two chorionepitheliomas, each about 1½ inches in diameter, were found in fundus uteri. Both ovaries had degenerated and contained numerous lutein cysts and theca-lutein cysts, but no metastases.

*Subsequent Treatment.*—On Aug. 6 patient returned to Jubilee Clinic. Deep radiotherapy was begun but ceased ten days later, because patient's condition was worse and she complained of severe pain in chest and of cough. Radiography showed progression of lung metastases.

By Aug. 17 gonadotrophic-hormone level in urine had risen considerably to 27,750-55,000 m.u. per litre.

On Aug. 15 treatment was begun with stilbœstrol in tablet form, 1 mg. thrice daily. Tablets were well tolerated, so dose was gradually increased. Temperature, which had been subfebrile, became normal; cough and pain in chest disappeared; appetite improved remarkably; and the patient, who had been confined to bed since her condition had become worse, got up. After only eight days pregnancy reaction was negative (gonadotrophic-hormone level in urine less than 333 m.u. per litre). The patient was discharged from hospital, still taking stilbœstrol 12 mg. a day.

Three weeks later she returned for examination. At home her appetite had been good, and she had felt well and had been able to work. Cough and pain had disappeared. Her general condition was now good; moderate oedema in both lower legs; intense pigmentation of linea alba and mammary areolae; mamma otherwise normal; no metastases palpable. Radiography of lungs showed that two of the metastases had become bigger but that the others had not progressed. The gonadotrophic-hormone level in urine had increased to 4200-17,750 m.u. per litre; so dose of stilbœstrol was raised to 30 mg. a day.

The patient returned about a month later, having had hæmorrhage from vagina but no other trouble. She had taken 30 mg. of stilbœstrol a day without discomfort. Her general condition was still good; a blue soft transparent secondary deposit about 2 inches in diameter was found in vagina; but radiography showed that lung metastases had regressed.

The dose of stilbœstrol was gradually raised to 110 mg. a day in the next fortnight, during which the vaginal metastasis became smaller, her general condition improved, and gonadotrophic-hormone level, determined in middle of this period, fell to 333-4200 m.u. per litre of urine.

Later the patient suddenly had pyrexia, and treatment with stilbœstrol was stopped. After some days it was confirmed that the pyrexia was due to infection of the vaginal metastasis. Penicillin was given and, when the temperature had subsided, treatment with stilbœstrol was resumed, now parenterally. The vaginal tumour, which had grown bigger, now shrank, and gonadotrophic-hormone level, which had risen to 17,750-27,750 m.u., fell to 4200-17,750 m.u. per litre of urine.

Ten days later infection flared up again, vaginal metastasis increased, and gonadotrophic-hormone level in urine rose to 100,000-200,000 m.u. per litre. When the dose of stilbœstrol was raised to 100 mg. a day, the general condition improved, the gonadotrophic-hormone level in urine fell to 27,000-55,000 m.u. per litre, and the lung metastases diminished further. This improvement did not last long. Hæmorrhages from vaginal tumour produced extreme anæmia, and the patient's condition deteriorated. When she was moribund the dose of stilbœstrol was increased to 1000 mg. a day. This was followed by temporary improvement in her general condition and by regression of the vaginal metastasis; but another virulent infection, with severe and bloodstained diarrhœa, led to the patient's death on Jan. 27, 1947.

During five months about 3400 mg. of stilbœstrol had been given by mouth and about 18,500 mg. parenterally. The oestrone content of urine rose, with increasing dose of stilbœstrol, to a maximum of 1,000,000 m.u. per litre.

*Necropsy* showed multiple metastases in vagina, lungs, intestines, liver, and spleen. Microscopically, hypophysis showed striking changes. Many basophil cells and, especially, eosinophil cells were small and shrunken, with pyknotic irregular nucleus; several basophil cells showed degeneration; chromophobe and amphophil cells with big nucleus more numerous than normally; some pregnancy cells observed.

## DISCUSSION

The prognosis of chorionepithelioma is very difficult to determine. The tumour may run an exceedingly rapid course (Richter 1939); but some types with widespread metastases are relatively benign. Occasionally the primary tumour in the uterus and vaginal metastases have regressed without treatment (Hörmann 1909), and radiographically confirmed metastases of the lung are supposed to be capable of regression (Zagorjanski-Kissel 1902, Fujimori and Kobayshi 1936). The factors determining the degree of malignancy are unknown, but they may include different powers of invasion by the chorionic epithelium and the individual reaction of the patient (McLaughlin 1941).



Stilbœstrol did not prevent the growth of a metastasis in the vagina. On the other hand, the metastases already present in the lungs regressed; and, when the dose of stilbœstrol was greatly increased, the gonadotrophic-hormone level in the urine fell, the vaginal metastasis regressed, and the patient's general condition distinctly improved.

Estrogens are broken down in the liver, and in experiments on animals large doses have produced hepatic necrosis. Despite the extremely large doses given in this case, there was no clinical evidence of injury to the liver. The bilirubin and citric-acid levels in the serum were normal throughout.

Several biopsies of the vaginal metastasis showed no histological change in the tumour cells. In the treatment of prostatic cancer with œstrogen, on the other hand, degenerative changes in the tumour cells have sometimes been found.

The œdema in the legs and the pigmentation of the linea alba and of the mammary areolæ were secondary effects due to large doses of œstrogen and have been observed previously. Malaise and vomiting sometimes prevent complete œstrogen therapy but were not observed in this case.

The temporary benefit in this case suggests that a better result might have been obtained by giving from the start doses of stilbœstrol large enough to keep the urinary gonadotrophic-hormone level down to normal or as low as possible.

In this connexion another case of uterine chorion-epithelioma and lung metastases may be reported, treated in November, 1947, at the Department of Gynæcology.

A woman, aged 32, received in twenty-four days 15,820 mg. of stilbœstrol, the last fifteen days 1000 mg. a day, parenterally. During the first ten days, parallel with a rising folliculin titre in the urine, the excretion of gonadotrophic hormone gradually fell from 25,000-50,000 M.U. to 2500-5000 M.U. in 24 hours. Later in the treatment, however, this excretion rose to about 100,000 M.U. in 24 hours. No effect on lung metastases was observed, and treatment was stopped. Vaginal hysterectomy was performed. In the normal-sized ovaries some follicular cysts were found but no lutein tumours (influence of stilbœstrol?). The patient died a month later. Necropsy showed widespread metastases. The hypophysis appeared normal microscopically.

#### SUMMARY

Chorionepithelioma with metastases in a woman aged 20 was treated with stilbœstrol.

The dose was gradually increased from 3 mg. to 1000 mg. a day.

This treatment brought about a temporary improvement in the patient's general condition and regression of the metastases in the lungs and vagina; but the vaginal metastasis became severely infected, leading to hæmorrhages, anæmia, and cachexia.

In another case, treated with stilbœstrol for a relatively short time, no effect on the metastases was observed.

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"... Anthropology, which is the scientific study of the societies which men have formed in different parts of the world, has discovered that human nature is an extraordinarily variable thing. The really innate qualities of men, the basic characteristics which society cannot change but must accept and build on, are much vaguer than anyone could have expected."—Prof. C. H. WADDINGTON, F.R.S., in *The Scientific Attitude*, London, 1948.

## POLIOMYELITIS AND ASSOCIATED MINOR ILLNESS IN A RESIDENTIAL SCHOOL

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THERE have hitherto been few reports on poliomyelitis in residential schools. The School Epidemics Committee (1938) mentions only 3 cases and 2 probable cases in the five years 1930-34 among a population at risk averaging 10,270 boys and 3503 girls. Smith (1939) recorded details of a number of school outbreaks, six of which related to residential schools in this country. Abortive cases are mentioned in four of these, and for two of them figures are given: in a school numbering 75 boys there were 8 abortive cases and 7 showing evidence of involvement of the central nervous system (including meningitic irritation); and in another school of 88 boys there were 7 abortive and 4 paralytic cases.

The outbreak to be described involved two boarding-houses, containing 48 and 43 boys, in a public school comprising 411 boarders. There were 1 paralytic case, 6 non-paralytic cases diagnosed as poliomyelitis on clinical grounds and in 1 case by lumbar puncture, and 25 cases of associated minor illnesses, some at least of which were probably abortive poliomyelitis. The cases of non-paralytic poliomyelitis were usually no more obviously ill than many of the associated cases of minor illness, and in diagnosing them as such the objective signs of neck-rigidity or of sustained nystagmus were taken as indicating involvement of the central nervous system (McAlpine et al. 1947). Routine lumbar puncture was not performed, since it was considered unjustified from the patients' viewpoint.

When the school reassembled for the autumn term in September, 1947, 1 case of poliomyelitis had already been notified in the adjacent town, and 2 occurred shortly afterwards. It was therefore arranged that every boy with pyrexia or gastro-intestinal symptoms, however trivial, should see the medical officer and, if at all suspicious, be isolated in bed. The incidence of these minor illnesses, excluding those that were clearly due to specific causes such as tonsillitis, is shown in the accompanying figure, where the incidences in the two houses where cases of poliomyelitis occurred are charted separately, and the cases of poliomyelitis are shown concurrently. The events in these two houses bore no immediate relation to each other and are described separately.

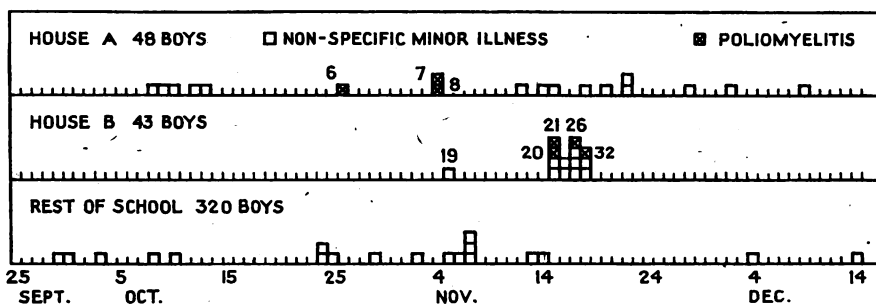
#### HOUSE A

In house A, comprising 48 boys divided among seven bedrooms and fifteen studies, no sickness was reported during the first two weeks of term. Between Oct. 8 and Oct. 13, 5 boys (cases 1-5) reported sick; 2 with vomiting, 1 with vomiting and headache, 1 with nausea and headache, and 1 with nausea and diarrhoea. Two of these slept on either side of a boy (case 6) who began to feel ill on Oct. 24.

Case 6.—A boy, aged 15, complained of headache on Oct. 26; he had felt unwell for the previous two days. He was found to have a temperature of 100.2°F, a moderate degree of neck-rigidity, and a weakly positive Kernig sign. He was isolated in bed and recovered completely in two days.

On Oct. 27 case 7, the study companion of case 6, had a transient temperature of 99.6°F but returned to school next day. On Nov. 4 he reported sick again.

Case 7.—A boy, aged 15, complained of loss of power in the right arm and of headache. He had had a transient temperature of 99.6°F seven days previously, had vomited



Incidence of poliomyelitis and minor illnesses in two houses compared with the rest of the school.

two days previously, and had had a headache and stiff neck for twenty-four hours. He had a temperature of 102°F, well-marked neck-rigidity, and gross loss of power in the muscle groups innervated by C5, 6, and 7 on the right side. The cerebrospinal fluid (c.s.f.) contained 45 cells per c.mm. No further paralysis developed, but that of the right arm persisted.

Also on Nov. 4 case 8, an intimate friend of cases 6 and 7, who often visited from the next study, reported sick.

**Case 8.**—A boy, aged 16, complained of stiff neck which had been present for twelve hours, but no headache. He had a temperature of 101°F, and very pronounced neck-rigidity. The c.s.f. contained 164 cells per c.mm. and 55 mg. of protein per 100 ml. The pyrexia and meningism disappeared in four days, and recovery took place without paralysis.

During the next five weeks 6 more boys reported sick with vomiting and 4 with vomiting and slight diarrhoea. Of these 10 boys (cases 9–18) 4 had been bedroom or study contacts of a poliomyelitis patient seventeen or eighteen days previously; 3 others had been bedroom or study contacts of these 4, fourteen, ten, and eight days previously; and of the remaining 3, 2 were bedroom contacts of each other with an interval of twenty-four days. It cannot be concluded that these cases were abortive poliomyelitis. However, the incidence for the term of non-specific minor illness in house A was 31% of the population at risk, whereas that for the remainder of the school (excluding house B) was 6%. This difference is statistically significant (difference/standard error = 5.6).

#### HOUSE B

In house B, comprising 43 boys divided between five bedrooms and three studies, there was no illness (except 1 case of bronchitis) until Nov. 5, when case 19 reported what at the time was regarded as a triviality.

**Case 19.**—A boy, aged 17, complained of headache and dizziness, followed next day by diarrhoea. He remained in school, but six days later (Nov. 11) reported with a stiff neck. He was found to have a tender left trapezius. He recovered uneventfully.

On Nov. 15, 4 boys (cases 20–23) were attacked with vomiting. Of these, 2 recovered after a transient diarrhoea and showed no other signs; and 2 (cases 20 and 21) showed signs of involvement of the central nervous system.

**Case 20.**—A boy, aged 14, complained of vomiting, headache, and abdominal pain. He was afebrile but had slight neck-rigidity, a weakly positive Kernig sign, medium lateral nystagmus, and sluggish tendon-reflexes in both arms. He made an uneventful recovery in two days.

**Case 21.**—A boy, aged 14, complained of vomiting and headache. He was afebrile but had slight neck-rigidity. He recovered uneventfully in twenty-four hours.

On Nov. 16, 2 more boys (cases 24 and 25) reported sick, one with vomiting and the other with malaise, sore throat, and a slight pyrexia; both recovered uneventfully. On Nov. 17 a further 4 boys (cases 26–29) reported sick, of whom 2 with vomiting and fever or

diarrhoea and 1 with malaise and aching limbs recovered uneventfully, whereas the fourth (case 26) developed signs of involvement of the central nervous system.

**Case 26.**—A boy, aged 14, complained of abdominal pain and nausea. He was afebrile, but vomited during the night after admission. He then settled down, but on the fifth day vomited again and had slight diarrhoea. His temperature rose to 100°F, and he became rather apathetic; medium

lateral nystagmus was present. He subsequently recovered in two days.

On Nov. 18, 3 more boys (cases 30–32) reported sick, of whom one with vomiting and a temperature and another with nausea and a headache recovered uneventfully, whereas the third (case 32) developed signs of involvement of the central nervous system.

**Case 32.**—A boy, aged 14, with aortic incompetence, complained of bad headache, nausea, and diarrhoea. He was afebrile but obviously apathetic; there were slight neck-rigidity and a weakly positive Kernig sign. The day after admission the neck-rigidity was more pronounced and there was slight central abdominal tenderness. He subsequently recovered uneventfully.

These 14 cases (cases 19–32) were evenly distributed among bedrooms and studies, and during the remaining four weeks of term no further cases occurred. With the possible exception of case 19, it is reasonably certain that all these cases were the result of the same infection; and, a diagnosis of non-paralytic poliomyelitis having been made in 4, the remainder may be regarded as abortive forms of the same disease. It is at least possible, that case 19, who developed the disease ten days before the other cases and was not isolated, was the carrier responsible for introducing the infection.

#### DISCUSSION

It is dangerous to conclude too much from observations unconfirmed by laboratory evidence. Nevertheless the following facts can be accepted. First, in house A a clinically recognisable case of non-paralytic poliomyelitis was followed eight to ten days later by poliomyelitis diagnosed clinically and by examination of c.s.f. in 2 intimate contacts. Secondly, the incidence during the term of non-specific minor illness in house A was higher than that obtaining in the rest of the school (excluding house B) by a statistically significant amount. Thirdly, a case of non-specific minor illness in house B was followed ten days later by an outbreak of illness involving 13 boys within four days, in 4 of whom non-paralytic poliomyelitis could (with the knowledge that the disease was present in the school environment) be diagnosed clinically.

The incidence of minor illness in house A (31%) and the attack-rate of abortive poliomyelitis in house B (21%, or 33% if the non-paralytic cases are included), compared with the minor-illness rate for the rest of the school (6%), approximate to the findings in two American surveys. Paul et al. (1932) found that among 222 familial contacts of poliomyelitis below the age of nineteen, 24% had a minor illness within three weeks, against 7% among non-contacts. Casey et al. (1947) found that, of 22 child contacts, 4 (28%) developed fever and mild constitutional symptoms, compared with 6% in non-contacts, while another 3 developed poliomyelitis, 1 paralytic and 2 non-paralytic. The conception of poliomyelitis as a widespread infection producing a mild illness in roughly a third of those exposed to infection if of susceptible age, but paralysis in relatively few, is thus illustrated again.

It is nevertheless in this mild form that recognition of the disease is most desirable, particularly when it occurs in schools or institutions. In the first place, the rôle of the subclinical case in the dissemination of epidemics has been by now well established—for example, by McFarlan et al. (1946) in Mauritius. It is likely that the events described above in house B illustrate this point. In the second place, there is good evidence that immobilisation of the patient during the non-paralytic stage offers the most hopeful means of avoiding, or reducing the severity of, paralysis (Russell 1947). It may be significant that the only boy who developed paralysis in the present outbreak was also the only one who remained ambulant after the development of signs indicating involvement of the central nervous system.

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**GANGRENE FOLLOWING INTRA-ARTERIAL INJECTION OF MYANESIN WITH A STUDY OF BLOOD AND MYANESIN MIXTURES**

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THE grave dangers of accidentally injecting chemical substances into an artery do not appear to be fully realised; and though fortunately these incidents are extremely rare they should nevertheless be borne in mind, and due precautions should be taken.

Van der Post<sup>1</sup> reports a case in which 6 ml. of 10% soluble thiopentone was given into an aberrant ulnar artery that came off the brachial artery 1 in. above the elbow. Next day the terminal phalanges of the thumb and the little and ring fingers were gangrenous. The radial artery was palpable at the wrist, but the ulnar artery could only be palpated at the elbow. At operation a thrombus  $\frac{3}{4}$  by  $\frac{1}{8}$  in. was extracted from the ulnar artery just below the elbow-joint. The terminal phalanx of the thumb was saved, but the terminal phalanges of the two fingers were lost.

Macintosh and Heyworth<sup>2</sup> report two cases. In the first case 1.5 ml. of 10% soluble thiopentone was injected into an aberrant ulnar artery of a boy aged 5 years. There was severe pain in the hand, and the distal part of the forearm became blanched. The colour improved an hour later, and in two days he was discharged from hospital. Eight days after the injection he was readmitted with an anæmic cold hand and blue finger-nails. No pulsation was present beyond the middle of the elbow-joint. Two days later 1 in. of the brachial and ulnar arteries was resected, the latter being completely thrombosed. Unfortunately no improvement took place, and amputation through the forearm was performed three weeks later.

The second case was in a young man who had an operation for varicose veins, when 5 ml. of 10% soluble thiopentone was injected into an abnormal ulnar artery. Almost immediately this vessel became thrombosed for 4 in. of its superficial course down the forearm, and the middle, ring, and little fingers turned white and cold. Colour and warmth returned in three-

quarters of an hour, and ten days later the patient was symptomless, but with a thrombosed aberrant ulnar vessel.

In the following case 'Myanesin' was injected intra-arterially, and experiments were subsequently made to study the effect of this substance on blood.

## CASE-RECORD

A woman, aged 67, was admitted to the Essex County Hospital on May 15, 1947, with a month's history of indigestion. She said cholecystectomy and appendicectomy had been done at another hospital in 1939. Neoplasm of the stomach was provisionally diagnosed.

A laparotomy was performed at 11 A.M. on May 20. The stomach and duodenum were normal, but the gall-bladder was still present, with thickened walls and surrounded by many adhesions. Cholecystectomy was done in the usual manner. During the operation 10 ml. of 10% myanesin was injected into the median basilic vein to obtain muscular relaxation. Only a small quantity of blood was withdrawn into the syringe; but, as usually happens, part of this blood remained in the syringe until the injection was completed. No difficulty was experienced, and the time taken for the injection was 20-30 sec. This batch of myanesin had been used previously with no ill effects. At 8.30 P.M. the same day the right forearm and hand were much discoloured, deeply cyanosed, and of marble coldness; but a good radial pulse was easily palpable at the wrist. A brachial-plexus block was performed with procaine, but the circulation did not improve. Next day the hand and forearm were still blue, cold, and functionless, although there was a good radial pulse. A cervical-sympathetic block was done, but though the fingers may have been slightly warmer for a short time they were still deeply cyanosed. A Horner's syndrome followed the sympathetic block.

On May 22 the arm was blue, cyanosed, and cold from the finger-tips to the elbow, the nails being almost black. No true line of demarcation formed, but the change from cold cyanosed to warm healthy skin was abrupt, occurring within a finger's breadth. The brachial artery was exposed opposite the elbow-joint; the wound bled freely above the elbow, but did not bleed below the joint level, and the superficial veins were collapsed. The patient was thin, and the artery ran a normal but superficial course immediately beneath the deep fascia. No thrombosis was present in the brachial, radial, or ulnar artery. There was no evidence of hæmatoma or of bruising of the vessel resulting from needle puncture. A fine needle, however, had been used; so the vessel might have been punctured without a hæmatoma forming. An injection of 10 ml. of normal saline solution was given into the brachial artery. At the close of this operation the radial pulse could not be felt and pulsation never returned.

The gangrene of the hand and forearm progressed (fig. 1), but the patient's general condition gave no cause for anxiety. The arm was amputated 3 in. above the elbow-joint on June 6.

*Histological Report.*—"Arm amputated with lower 5.5 cm. of humerus. The fingers and skin to the creases at the wrist shrivelled and brownish-blue. Sutured incision 13.5 cm. long on anterior aspect of forearm. Section of brachialis muscle normal; the muscle-fibres of pronator teres necrosed without inflammatory infiltration. Upper end of brachial artery shows unorganised ante-mortem thrombus attached to intima; medial and adventitial coats normal. Slight proliferation of macrophages in outer part of muscle coat of basilic vein. In the connective tissues about the artery and vein is a granulomatous reaction with lymphocytes, plasma cells, and macrophages. Small needle-shaped crystals are also present, in places confined within the lumen of lymphatics. The ulnar artery contains a recent unorganised ante-mortem thrombus. Radial artery normal. Arterioles, capillaries, and veins in the subcutis at the wrist are normal, containing erythrocytes separated and with clear contours."

It therefore seems that, in spite of adequate skill and care in making the injection, some of the solution was injected into the brachial artery instead of into the median basilic vein. That this could easily have happened was realised when the brachial artery was exposed and its superficial course noted. A puzzling feature was the presence of gangrene of the forearm and hand with a good radial and ulnar pulse at the wrist. When the brachial artery was exposed, it was also noted that the superficial veins of the forearm were collapsed.

1. Van der Post, C. W. H. *S. Afr. med. J.* 1942, 16, 182.

2. Macintosh, R. R., Heyworth, P. S. A. *Lancet*, 1943, ii, 571.

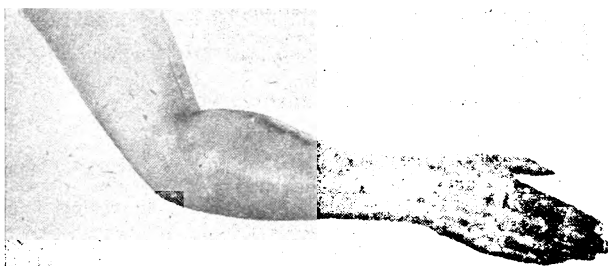


Fig. 1—Gangrene of hand and forearm after intra-arterial injection of myanesin.

EXPERIMENTS

It had been noted previously on giving intravenous injections of myanesin that when blood was withdrawn into the myanesin it immediately became chocolate-coloured and appeared to coagulate. Therefore, to determine the action of myanesin on blood in the test-tube, different amounts of 10% myanesin were added to 1 ml. of fresh heparinised blood. This was obtained by taking blood (from J. B. P.) directly into a bottle containing dried heparin in the proportion of 100 i.u. to 10 ml. of blood. Nine test-tubes, each containing 1 ml. of heparinised blood, were taken, and 10% myanesin was added in the following quantities: 5.0, 2.0, 1.0, 0.5, 0.2, 0.1, 0.05, 0.02, and 0.01 ml. A similar experiment was done with 10 ml. of blood in each tube and ten times these amounts of myanesin. Strictly comparable results were obtained (fig. 2). The myanesin was run on

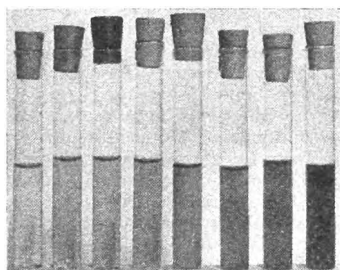


Fig. 3—Plasmas from 10 ml. of blood to which 10% myanesin has been added in the following quantities (reading from left to right): nil, 0.01 ml., 0.02 ml., 0.05 ml., 0.1 ml., 0.2 ml., 0.5 ml., and 1 ml. Mixtures were left 40 min. before plasmas were spun off.

top of the blood and mixed as rapidly as possible. All tubes showed lysis at the interface between the blood and myanesin before mixing. Immediately on mixing, tubes 1, 2, and 3 became light chocolate-brown and "curdled." In tube 4 the blood lysed completely in 1 min. and curdled within 10 min. In tube 5 lysis was complete in 7 min., but there was no curdling within 40 min. In tubes 6, 7, 8, and 9 lysis occurred immediately and up to 40 min. (fig. 2). The degree of hæmolysis after 40 min. with different amounts of myanesin is shown in fig. 3. In lower concentrations of myanesin hæmolysis was either absent or negligible. After standing overnight, tubes 2, 3, 4, and 5 formed a solid mass, while tube 1 contained fine light-brown floccules which could be spun down.

It was thought that the speed of mixing the myanesin and the blood might have some effect on the amount and time of hæmolysis. To ascertain whether this was so, to each of two test-tubes containing 1 ml. of heparinised blood 0.1 ml. of 10% myanesin was added, in the first tube rapidly and in the second slowly. Fig. 4 shows that the rate of mixing had no appreciable effect on the estimated amount or time of hæmolysis.

To see whether soluble thiopentone had a similar effect to that of myanesin on blood, to six test-tubes, each containing 1 ml. of heparinised blood, 5% soluble thiopentone was added in the following quantities: 5.0, 2.0, 1.0, 0.5, 0.2, and 0.1 ml. Mixture was effected again as with the myanesin. No lysis was seen at the interface between the blood and soluble thiopentone before mixing, and after mixing no curdling took place.

No naked-eye change in the blood was noted. Hæmolysis was estimated at various times up to 40 min., and even with the highest concentration of soluble thiopentone the amount of hæmolysis after this period was only 2.5% of the total blood. For practical purposes this is negligible.

A similar experiment was carried out with 1% *d*-tubocurarine ('Tubarine' B.W. Co.) but there was no hæmolysis at the end of an hour.

These laboratory experiments show that, when blood and myanesin are mixed, profound changes take place. In low concentrations there is little or no effect, in higher concentrations hæmolysis takes place, and in higher concentrations still the blood apparently curdles; it may in fact turn solid, the appearance being that of protein coagulation. The effects occur in the main immediately the myanesin comes in contact with the blood. Neither curare nor soluble thiopentone gave such a result and were only negligibly if at all hæmolytic. While these experiments were in progress Pugh and Enderby<sup>3</sup>

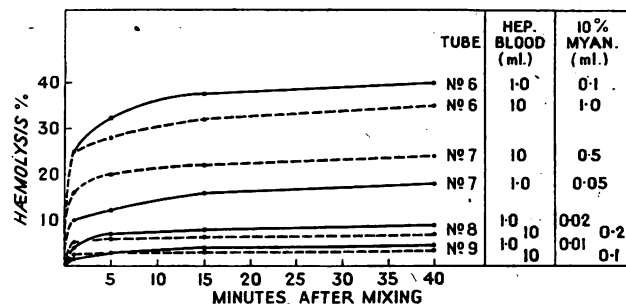


Fig. 2—Percentage of hæmolysis when either 1 ml. or 10 ml. of heparinised blood is mixed with increasing amounts of myanesin in tubes 6, 7, 8, and 9.

reported three cases of hæmoglobinuria following the intravenous injection of myanesin, and they showed that this substance was hæmolytic both in vivo and in vitro. We agree that myanesin is hæmolytic in vitro, but we have noted the additional phenomenon of curdling, which may be much more important and has a bearing on our case.

To determine the nature of the "curdled" material the following experiments were carried out:

- (1) 10% myanesin was added in decreasing amounts to heparinised plasma, and considerable precipitation occurred even in the proportion of 5 parts of plasma to 1 of myanesin. A similar effect was obtained with oxalated plasma and with serum.
- (2) Myanesin added to dry heparin had no effect, but on the addition of plasma to the mixture precipitation occurred immediately.
- (3) Myanesin mixed with water or with normal saline solution showed a precipitate which redissolved on shaking.
- (4) Myanesin is irreversibly precipitated from solution on addition of small quantities of the usual multivalent colloid precipitants.

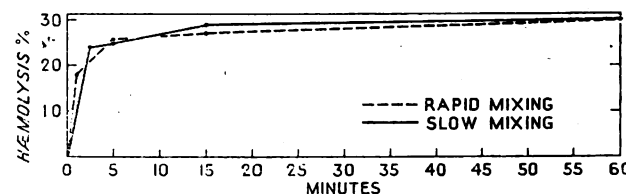


Fig. 4—Percentage of hæmolysis after slow and after rapid mixing of blood with myanesin.

(5) The precipitate from plasma is at first too fine to be held by ordinary filter-paper, but, on ageing, it clots to a filtrable precipitate which is insoluble in water and saline but can be dispersed in alkaline carbonate solution. This precipitate after repeated washings contains a small proportion of protein material detectable with Kingsley's reagent; the bulk

3. Pugh, J. I., Enderby, G. E. H. *Lancet*, 1947, II, 387.

of it is myanesis, as shown by quantitative colorimetry with the phenol reagent of Folin and Ciocalteu.

(6) On microscopy the curdled mass in both blood and plasma showed amorphous granular material.

It seems that the curdling we have observed is not due to the effect of myanesis on the blood, plasma, serum, or heparin, but that there is an alteration in the physical state of the myanesis with its subsequent precipitation from solution by some constituent or constituents of the blood.

It is therefore possible that the gangrene in this case can be explained by the profound change which takes place when blood and myanesis are mixed. This change is a colloid precipitation which occurs almost immediately after mixing, and it is possible that the coagula thus produced and shot into the artery could be too small to block the main arteries but sufficiently large to occlude the small arteries and arterioles. It may be suggested from the histological report that the gangrene was due to the ante-mortem thrombi present in the brachial and ulnar arteries as a direct result of the action of myanesis on the arterial wall. However, when these vessels were exposed at the second operation they were pulsating normally, and the thrombi can therefore be taken to be sequelæ of this second operation. The gangrene was possibly caused by a shower of emboli blocking the arterioles, which would reasonably explain the presence of obviously patent arteries with a collapsed venous return. It is difficult to explain the sudden and permanent loss of pulsation in the radial artery that followed the exploration of the main vessels at the elbow. If our view is correct, the column of blood in the main arteries must have been stationary, and the slight additional trauma of saline injection was sufficient to precipitate a rapid and extensive thrombosis.

The importance, therefore, of avoiding intra-arterial injections becomes obvious; and, of the more common dangers, the presence of superficial or aberrant vessels in this region must be borne in mind, and due precautions must be taken to distinguish artery from vein. We hope that the foregoing account may be of help in avoiding those accidents, which though rare nevertheless have tragic results for the patient.

We wish to thank Dr. D. O'Brien for the histological report and Dr. J. Goodey for much assistance with the biochemistry.

"... a continual output of Public Opinion statistics on specific questions must have an insidious influence upon politicians, who find themselves under the greater temptation to exploit contingent waves of so-called opinion when they ought rather to be trying to lead or form opinion."

"... 'conscience' and 'authority' ... it seems, reside in the will and intelligence of the majority. But when? On the question just mentioned [capital punishment] Gallup tells us that this has changed by a fairly big percentage within a few months, showing that such a foundation for conscience and authority is a shifting one. And even if it stayed still, what weight would it bear? It is easy to count up the number of ayes and compare it with that of the noes, but how does one measure the degree of conviction that lay behind either of them? If we began to use this method to decide vital questions, we might find by the consequences that 90% had been expressing merely a faint preference for a measure which the remaining 10% would shed their blood to prevent. This idea that the will of society can be ascertained by numerical computation is an extraordinary exaggeration and caricature of the custom of decision by vote (which is, of course, a most useful convention in its right place). It would hardly deserve comment, but that unfortunately it has grown upon us unawares, and is now implicit in more than a little of our contemporary political thinking. As any sincere political thinker knows, the prevalence of such an assumption constitutes an abiding temptation to 'pass the buck.' Its ultimate effect in practice would be to place total and irresponsible power in the hands of those who controlled the means of publicity, mass-suggestion and the framing of the question put to the public."—*New English Weekly*, May 13, p. 42.

## MULTIPLE STREPTOCOCCAL ABSCESES OF LIVER

### RECOVERY WITH PENICILLIN

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CONSULTING PHYSICIAN, HASLEMERE AND GRAYLINGWELL HOSPITALS

THE prognosis of many conditions previously considered to be usually lethal has nowadays to be dramatically modified in the light of the results of penicillin therapy, as in the following case.

A woman, aged 56, was referred to the Royal West Sussex Hospital by Dr. F. R. P. Pepper, of Pulborough, because of three weeks' pyrexia. Her illness had started with pain in lumbar region, diffuse abdominal tenderness, rigors, and a temperature of 104°F. Her urine had contained pus cells, for which reason she had been given sulphathiazole, changed after two days to 'Sulphamezathine' because of vomiting. After an initial fall in temperature, the pyrexia had returned and again reached 104°F, with further rigors. Tenderness had moved to liver and gall-bladder area, the urine had become dark and the conjunctivæ slightly icteric, and vomiting had returned.

On admission the patient was over-weight and sweating, with temperature of 103°F. Tenderness, without swelling, in loins, passing forward to upper abdomen. Chest, heart, and blood-pressure normal. Urine contained albumin; a catheter specimen showed pus cells, a few red cells, and granular casts; on culture, it gave a scanty growth of *Bact. coli*. Blood-count: red cells 3,500,000 per c.mm., Hb 72%, colour-index 1.02, white cells 9800 per c.mm. (neutrophils 78%, eosinophils 1%, basophils 1%, lymphocytes 16%, monocytes 4%). Erythrocyte-sedimentation rate 30 mm. in 1 hour (Wintrobe).

A short course of sulphadiazine (15 g. in 2½ days) had no effect on the temperature, which continued to swing between 99° and 103°F. A further catheter specimen of urine showed pus cells and red cells, but there was no growth on culture. The white-cell count was now 12,700 per c.mm. (polymorphs 72%), and there was a shift of the Armet count to the left. Tenderness was now more pronounced over the liver area, a lump had become palpable in the gall-bladder region, and two rigors occurred. Anticipating suppuration, I called into consultation my surgical colleague, Mr. A. G. Ross, who considered an anterior subphrenic abscess as the most probable cause and decided on laparotomy.

At operation an enlarged liver presented, with its surface studded with yellow raised areas, the mass felt being one of these. These regions were slightly indurated, with fluctuant portions. The diagnosis seemed to lie between secondary malignant deposits and multiple abscesses. Aspiration yielded creamy pus, which was collected for culture. Rapid exploration of the abdomen did not reveal any other abnormality, and it was closed.

I incline to the view that infection in the perinephric region was probably present, as suggested by the lumbar pain and by pus and red cells in the urine. I gave a very gloomy prognosis, only relieved by the glimmer of hope that penicillin might modify this. The pathological report on the aspirated pus was that it contained large numbers of streptococci.

Penicillin 100,000 units was given forthwith and thereafter 60,000 units three-hourly for eleven days to a total dosage of 4,060,000 units. On the third day of penicillin therapy temperature reached normal and continued so. Patient's general condition improved with equally unexpected rapidity, her pain subsided, and her recovery was uneventful. Her doctor reported five months later that she was in perfect health.

Other cases of hepatic abscess in which recovery followed penicillin therapy have been reported by Flynn (1946), d'Abreu (1946), and Berman and Egbert (1941).

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## Reviews of Books

### Clinical Ophthalmology

H. M. TRAUQUAIR, M.D., F.R.C.S.E., consulting ophthalmic surgeon, Royal Infirmary, Edinburgh. London: H. Kimpton. 1948. Pp. 264. 25s.

THIS book has been written for the undergraduate and general practitioner, chiefly for the latter. The intention has been to present the subject in such a way that skill in the use of special instruments is not required, and thus no mention is made of examination of the retina. It is refreshing to read a book with such economy of phrase and directness of approach, and it is evident that a lifetime of experience has been condensed into this work. Besides the ordinary groundwork of anatomy, physiology, optics, and external diseases, the reader will find some subject matter unusual to such a work, including an account of the eye in youth and old age, common misconceptions and prejudices, and medico-legal aspects of the specialty. Answers are given to patients' questions on such topics as reading in bed and "ruining" the eyesight by close work.

### La chirurgie biliaire

PIERRE MALLET-GUY, professeur à la faculté de médecine de Lyons; RENÉ JEANJEAN, assistant à la faculté; PIERRE MARION, chef de clinique à la faculté. Paris: Masson. 1947. Pp. 138. Fr. 1200.

THIS book describes some elaborate researches carried out during operations on the biliary tract, consisting in the measurement of variations of pressure in the gall-bladder and common bile-duct, and in the radiography of these structures after they had been filled with opaque liquids. The technique is extremely complicated and necessitates a specially designed operating-table, X-ray equipment with its centring apparatus, a self-recording manometer, and minor things such as cannulae of particular shapes. Even with this equipment, other precautions must be taken if the readings are to be reliable. The exposure necessary to carry out these procedures must be such that no retraction of the abdominal wall is required, and this means a large and unpleasantly disposed incision. It is difficult to get results with general anaesthesia, and the spinal method is useless because it paralyses the splanchnic nerves. Very beautiful demonstrations of the tone of the musculature of the bile-ducts, sphincter of Oddi, and gall-bladder are given, and information has been obtained which it is impossible to get otherwise. Whether it is of sufficient value to justify such methods as a routine, or whether they are only to be regarded as methods of research, the future will show. The authors rather frequently find that sphincterotomy at the lower end of the common bile-duct is indicated, and an onlooker may well ask whether removal of the primary disease in the gall-bladder may not of itself lead to a return of normal tone and function.

These researches were undertaken between 1942 and 1945 when 250 gall-bladder patients were studied in this way. Up to date 550 observations have been made.

### Über die Kaliumbestimmung in biologischer Substanz

W. K. RIEBEN, professor of experimental medicine in the University of Oregon; formerly research assistant in the Chemical Institute, University of Zürich. Basle: Schwabe. 1947. Pp. 73. Sw. fr. 12.

THE determination of potassium in biological materials has long presented difficulties. The number of modifications of the two methods most widely used—i.e., cobaltinitrite and platinum hexa chloride precipitations—testifies to the fact that neither is entirely satisfactory. Dr. Rieben has now studied a new principle for the quantitative estimation of potassium, and described micro methods for serum or plasma, whole blood, urine, faeces, and tissues.

The procedure is described in great detail, for experience showed that details were important for satisfactory results. The sample is first ashed in a platinum crucible, and potassium is then precipitated in acid solution with phosphotungstic acid  $H_3PO_4 \cdot 12WO_3$ . The precipitate is washed and finally either weighed, or titrated to a pH of 8.0 using a mixed

indicator. The gravimetric procedure is applicable to 1–4 ml. in serum or to solutions containing 0.1–3 mg. K. The titrimetric method can be used for 0.2 ml. and 1.0 ml. samples.

The reagent, phospho-12-tungstic acid, gives no precipitate with sodium, calcium, or magnesium. The presence of these ions, or of ortho- and pyro-phosphates, in the proportions found in blood-serum does not detract from the accuracy of the method. Iron salts and iron oxide also do not interfere.

Extensive studies on the recovery of added potassium and on the properties of the precipitate, and comparisons with other gravimetric, titrimetric, and colorimetric methods, demonstrate the great accuracy of the procedure. The mean error with even the 0.2 ml. method is less than 2%. The simplicity and comparative shortness of the estimation, as well as the cheapness of the reagent, also recommend this new principle as satisfactory for the determination of potassium in biological substances.

### An American View of Health Insurance

*Private Enterprise or Government in Medicine.* L. H. BAUER, M.D., member of the board of trustees of the American Medical Association. Springfield, Ill.: Charles C. Thomas. Oxford: Blackwell Scientific Publications. 1948. Pp. 201. 25s.

A MOVEMENT in favour of compulsory health insurance began in the United States about 35 years ago, and between 1915 and 1921 Bills to establish it on a State basis were introduced into a number of State legislatures but without success. Public interest in the subject was revived during the economic depression, and in 1939 the first Bill to establish compulsory health insurance on a national scale was introduced into Congress but made no progress. Similar Bills were introduced after the war with the same result, though in 1945 President Truman in a special message to Congress recommended the adoption of compulsory health insurance. Such measures have from the first been opposed by the American Medical Association, and Dr. Bauer gives a clear and succinct account of the grounds on which the opposition is based. Compulsory health insurance is regarded as un-American and paternalistic; and it is contended that European experience shows that it degrades the standard of medical practice. Of England Dr. Bauer writes: "It is nothing unusual for a panel doctor to see thirty patients in the course of an hour. . . . Of the group of patients which may be in his office, he asks how many have a cold. All those are prescribed for without examination and are given the same prescription. If the patient objects, he is told to go see a specialist. The result is that medication is restricted by the Government." No authority is cited for these curious statements, which will surely surprise British insurance doctors. Voluntary health insurance is, however, now approved by the A.M.A. if certain defined conditions are fulfilled, and Dr. Bauer states that it is making considerable progress in the U.S.A., particularly for "catastrophic illness, that is, surgery, obstetrics, and in-hospital care." In his view it will eventually meet the country's needs "and make any compulsory plan unnecessary."

*Standard Radiographic Positions* (2nd ed. London: Baillière. 1947. Pp. 223. 21s.).—The first edition of this work by Nancy Davies, M.S.B., and Ursel Isenburg, M.S.B., was a handy pocket-sized volume which proved useful during the war to relatively inexperienced radiographers. By simple black and white drawings it illustrates the usual positions for radiography of the various organs. The attempt to expand it into something more than a good pocket-book is less successful, and the exposure chart recommended needs drastic revision.

*No Retreat from Reason* (New York: Harcourt, Brace and Co. 1948. Pp. 279. \$3.50).—The second chapter of Dr. Alfred E. Cohn's book provides the title and the keynote of most of what follows. Reason itself, he says, is merely a function of mind, and correct judgment depends entirely on the use made of it; but in a free society a retreat from reason is unthinkable: according to the path we take we shall advance to the greater good of man or become the architects of our own undoing. In ranging over a wide variety of subjects this book contains many wise and witty sayings. Dr. Cohn concludes that the Golden Age lies not behind us but ahead.

# THE LANCET

LONDON: SATURDAY, JUNE 19, 1948

## Admission and Visit

THE four regional hospital boards for London have explained that when they take over the hospitals on July 5 there will be as little change as possible in the admission of patients, which will normally be arranged directly between the practitioner and the hospital. But beds are so scarce that provision must be made for cases where direct application fails, and the metropolitan boards have therefore asked King Edward's Hospital Fund to expand its Emergency Bed Service, which for many years has been successfully arranging difficult admissions. Acting as the boards' agent, the E.B.S. will eventually organise an admission system throughout the four large metropolitan regions, establishing local admission centres where needed. For non-urgent cases, hospitals will maintain waiting-lists as at present, and will notify the patient when a bed is free. For certain other groups special procedure is required: thus recommendations for admission of tuberculous patients will usually go to the board itself through a tuberculosis officer; in mental cases admission will be arranged either by the "duly authorised officer" of the local health authority or directly with the mental hospital itself; and in maternity cases the E.B.S. will deal only with emergencies. Admission of infectious diseases will be undertaken by the E.B.S., but application should be made through the medical officer of health. In cases of chronic illness rigid selection is unfortunately necessary, but if the practitioner fails to secure a bed the E.B.S. will do what it can to help.

Related to the problem of admission is that of home visiting. The fact that in the new service specialist advice may be had without payment will encourage patients (or their relatives) to ask for a second opinion, preferably delivered in their own home; and excessive demands of this kind could of course threaten the efficiency of the whole service, which depends on economical use of the consultant's time. We may hope eventually for development of domiciliary visiting, which apart from advantages to the patient is capable of reducing the strain on hospitals; and there is every reason for experiment on the lines suggested by Dr. HARWOOD STEVENSON.<sup>1</sup> But until the number of specialists is greater, the service is most likely to work if everyone understands that specialist advice is obtainable only at the hospital or clinic unless the patient's condition prevents his admission to hospital or attendance as an outpatient. Save in emergency, specialist advice will be procured only through the general practitioner, who will have the unwelcome task of explaining that a specialist cannot be summoned unless there is really some good reason.

The mechanism to be used for bringing a consultant to the patient's home has now become rather clearer. Hoping for the answer "yes," the regional hospital board will ask every specialist at a non-teaching hospital in its area (the boards of governors doing the same in teaching hospitals) whether he will undertake such visits, and (if so) at what times

in the week and within what geographical limits, he is prepared to do so, and whether he will accept emergency calls. General practitioners will receive a list of the participating specialists, giving the name and telephone number of the hospital through which each can be called, and the hospitals concerned will serve as bureaux with a clerk on duty day and night. In an urgent case, if the practitioner asks for a particular specialist, the clerk will inquire whether an alternative specialist would be acceptable if the first cannot come; and if none of the specialists on the hospital's list is available he will if needed seek help from a neighbouring hospital. Where there is no great hurry, the practitioner will normally want to have the help of a particular specialist and will be prepared to wait until the next day when that specialist is free to take a non-urgent call: the clerk will ascertain his preference and the proposed day and time of the visit, and will make appropriate arrangements with the specialist; while the practitioner, on his side, will be asked to send to the hospital a brief note about the case for the specialist's information. The hospital management committees will be responsible for keeping this machinery moving, and part of their duty will be to keep records of calls and submit them, with claims for travelling and other expenses, to the regional hospital board, which will make the payments. Pending agreement on permanent scales, the boards are authorised to pay 4 guineas for a consultation, 5 guineas for a visit involving a minor operation, and 10 guineas for a visit involving a major operation—not more than 100 guineas being paid to any one doctor during a quarter.

These arrangements are provisional and experimental. What is necessary is to work out in practice a scheme for saving the time and energies of the specialist and of the family doctor, without erecting obstacles between them. The service must be protected against unfair demands; but it is even more necessary that fair ones should be fully and humanely met.

## Tsetse Flies and the Development of Africa

IN the past sixteen years half a million cases of sleeping sickness (out of a population of 22 million) have been recorded in Nigeria alone; and this was a period during which medical science has greatly diminished the incidence and gravity of the disease. Sleeping sickness, then, has been and still is a grave menace to the health of the African, especially on the west coast. But this is not the only, or even the most serious, way in which the tsetse fly retards the development of Africa. Nagana, the fatal fly-borne disease of horses and cattle, prevents the proper colonisation of vast areas of the continent. Without cattle, the natives are robbed of milk and flesh, and the ox-plough is replaced by the inefficient hoe. As a result, the Africans cling to the fly-free areas, which become over-populated, leading to soil erosion and general poverty. Here, then, is a vast problem to which the Englishman is contributing his scientific skill for the welfare of Africa. Areas which earlier settlers like the Arabs had found impossible to colonise are gradually opening up before the slow conquest of the tsetse. The struggle has progressed only by means of continuous research and its extensive application in the field.

On June 8 this was the subject of a Stephen Paget lecture to the Research Defence Society by Prof. P. A. BUXTON, F.R.S., who has gained first-hand experience of the work being done on the tsetse in the last three years by making extensive tours of the fly belts in east and west Africa on behalf of the Colonial Office. BUXTON emphasised the size of the problem by pointing out that the territory held by the tsetse, some 4,500,000 square miles, is about twice the area of the U.S.A. or about seventy-five times that of Great Britain. The beginnings of knowledge about the fly and its disease-carrying habits are found in observations of the early explorers. LIVINGSTONE himself, in 1858, made a startlingly accurate guess about the possible carriage of a noxious organism by the tsetse, before the transmission of pathogens by insects was recognised. The discoveries of the carriage of the trypanosome diseases of animals and man were made by BRUCE and others about the turn of the century. But it was not until the inter-war period that a systematic study of the detailed habits and distribution of the various species of glossina was begun by SWYNNERTON and his associates. One of the earliest methods of study was the "fly round," a periodic peregrination with a bait animal, to count the numbers of tsetse coming to feed on it. Useful information about fly density in different areas and at different times of year was obtained; but it was only of a relative nature. Subsequently, JACKSON introduced a method of releasing marked flies and attempting to recapture them at intervals. From the proportions of marked flies in the subsequent captures, after correction, the absolute numbers of flies in a given area could be estimated. Concurrently with work on the flies, research progressed on the trypanosomes and the intricate problems of infection of the fly and the cycle in that host.

Several methods of fly control have been adopted on the basis of the research findings. One of the most important results was a good knowledge of the particular habitats of different tsetses. These breeding and resting sites, which BUXTON illustrated in a coloured film, are often very sharp and specific to certain areas (e.g., strips along rivers or stream banks) or even to certain types of tree and scrub. It is therefore possible to exclude some flies by selective clearing; sometimes the work merely entails felling a very small proportion of vegetation to eliminate flies from a large area. The fly-counts and the knowledge of the slow breeding habits of the insect have suggested another method of elimination: by simple repeated hand catching. This has been found effective and practical in some isolated sites. A third and highly valuable method of attacking tsetse is by colonisation. The agricultural and other activities of human settlers above a certain density will drive away the flies and eventually render the area safe for cattle. If colonisation is left to the African he will do it patchily, engulfing neglected areas of fly belt because he does not consider them fertile enough. This results in maximum contact between the fly and man and his animals and leads to failure. Government settlement schemes are therefore necessary; schemes which need careful consideration of tribal customs, agricultural needs, and a host of other problems unrelated to the tsetse. A most successful venture of this kind has been

carried out at Anchau in Northern Nigeria (700 sq. miles).

Then there is the method of fly elimination which has aroused misgivings in naturalists and big-game hunters—the systematic destruction of large game in the required area. This method is clearly effective, for some important tsetses, such as *G. morsitans*, disappear with the game; and the game animals are the reservoir of trypanosome infection for domestic cattle. The practicability of game clearance has been demonstrated in Southern Rhodesia, where the largest tsetse-fly clearance in Africa has been achieved by this method. Modern insecticides have been brought into use against the tsetse fly and large-scale experiments are still in progress. Perhaps the air-plane spraying of D.D.T. or gamma-B.H.C. smokes will be found a useful aid in clearing important or localised breeding sites, but the method is far too expensive to be applied to the main problem. The attack on the trypanosome which causes human disease has continued, and curative and prophylactic drugs are being widely used. The prolonged suppression of the parasite which can be achieved suggests that, if the drugs are given to a sufficiently high proportion of the population, sleeping sickness can be stamped out of some areas by this means alone. BUXTON foresaw that some of these numerous measures now considered promising will perhaps eventually be dropped. But the complexity of the problem seems to demand complex remedies.

### Bacteriological Nomenclature

WHAT'S in a name? So far as bacteria are concerned there may be much or little. Scientific names are now given to bacteria with the intention of making clear the relationship of one organism with another. This was not always so; in the last century every rod-shaped organism was called by the generic name *Bacillus*, which in no way indicated its systematic position. In 1936, at the second congress of the International Association of Microbiologists, the generic name *Bacillus* was reserved for the aerobic spore-bearing group. But even now some medical students are taught the anachronistic nomenclature of the *Bacillus* era, and medical journals (ourselves included) still often allow it to invade their columns. It is time that medical bacteriologists, especially teachers, abandoned their names-don't-matter attitude and learned a little of what systematists throughout the world are trying to do to make the name something more than a label.

The modern English usage, as exemplified by Topley and Wilson's *Principles of Bacteriology and Immunity*, is based on an interim report of a committee of the Society of American Bacteriologists. In America, nomenclature has evolved from the final report of the same committee, the different stages being represented by successive editions of Bergey's *Manual of Determinative Bacteriology*. Topley and Wilson's classification may be described as a conservative application to bacteria of the binomial system of nomenclature. In the first edition most of the gram-negative rod-shaped bacteria, chiefly of intestinal origin, were placed in an unwieldy genus *Bacterium*, but the latest edition (1946) recognises the separation of the typhoid-food-poisoning group as the genus *Salmonella* and the dysentery bacilli as



Shigella. Other coliforms and related organisms remain as Bacterium, though groups within the genus are recognised without being accorded generic rank. Thus Escherichia, Aerobacter, Citrobacter, Eberthella, Erwinia, Alcaligenes, and Klebsiella, to mention some of the generic names found in American literature, are not used, and sound arguments against their adoption are given. The separation of some of these so-called genera.—Klebsiella from Aerobacter, for example—is so ill defined that the site of origin, above or below the umbilicus, is often the deciding factor. British bacteriologists may think that some of these groups deserve generic rank but believe that recognition would be premature until we know better how to distinguish them. The sixth edition of Bergey's *Manual* is not yet obtainable in this country, but earlier editions have each involved shifting many species from one genus to another, and we are told that the American Type Culture Collection, which adheres to Bergey's nomenclature, has had to change the names of nearly all its cultures to conform with the 1948 edition of the *Manual*. Unstable nomenclature of this kind does not appeal to bacteriologists here, and the only consistent users of Bergey names are biochemists, who must abide by the editorial policy of the *Biochemical Journal*.

Names of species present a different problem; confusion from synonyms (different names for the same organism) is greater than from homonyms (the same name given to different organisms). Some bacteria masquerade under many names; the organisms themselves may be well known (*Pseudomonas pyocyanea*, *Ps. aeruginosa*) and the synonymy easily checked, or they may be less common (*Bacillus polymyxa*, *B. aerosporus*) when the multiple names will be more confusing. In many examples of synonymy the description appended to the first and legitimate specific name was vague or insufficient for a subsequent worker to identify the organism; in others the second or subsequent name was bestowed because the author either did not know of the earlier name, or thought that the organisms were sufficiently different to justify distinct specific names. Homonymy is uncommon; an example is *Actinomyces bovis*, which has been applied to both an aerobic and an anaerobic species, the former being regarded as a harmless saprophyte, the latter as the probable cause of actinomycosis. To avoid confusion the specific name *israelii* has been proposed for the anaerobe.

What can be done to put matters straight? Bacteriologists themselves, through the International Association of Microbiologists, have drawn up a code governing the acceptance of names already given and rules and recommendations for new names. This Bacteriological Code was approved by the fourth congress of the association at Copenhagen in 1947, and has recently been published.<sup>1</sup> The association also established a Nomenclature Committee which from its members elected a judicial commission to give "opinions" on the validity of proposed names of genera and species. The commission will draw up lists of proposed names so that homonyms may be avoided in choosing new names. Some names, invalid by strict application of the rules but sanctioned by common usage, may be allowed to stand and will be

published by the commission as *nomina conservanda*; others will appear on lists of *nomina rejicienda*. It is unlikely that these opinions and lists will be available before further confusion has arisen; the Nomenclature Committee was first appointed in 1930 and so far only two generic names (Bacillus and Salmonella) have been approved. The committee has set up subcommittees to consider the family *Enterobacteraceæ* (Salmonella, Shigella, Bacterium) and the genus Streptococcus; these subcommittees have to tackle thorny problems and will do well if they can produce schemes acceptable to the differing viewpoints of bacteriologists. What, then, of the immediate future? American workers, with a new edition of Bergey's *Manual* as a stimulus, will presumably use new combinations and entirely new names, based on the recommendations of the Bacteriological Code. British bacteriologists are likely to remain faithful to the names they now use and to modify them when there is sufficient evidence that a change is needed. The list of species maintained by the National Collection of Type Cultures, shortly appearing as a M.R.C. Memo, will be a valuable guide to current British practice.

### Chloromycetin in Rickettsial Infections

THE efficacy of the antibiotic, chloromycetin, in scrub typhus is likely to prove a discovery of capital importance. The first results of the Anglo-American clinical trial proceeding in Malaya suggest that we at last have a potent remedy for the rickettsial diseases. The antibiotic was isolated in 1947 by EHRLICH and colleagues<sup>1</sup> in Detroit from a soil actinomycete, and its active principle, obtained in crystalline form, was found to differ from any antibiotic so far described in containing both nitrogen and non-ionic chlorine. In laboratory infections chloromycetin, weight for weight, appeared more effective against *R. prowazeki* in chick embryos than any other agent tested under these experimental conditions, and large doses produced no symptoms in animals. These encouraging laboratory results demanded clinical trial in human typhus infection, and satisfactory results were claimed in a few cases of epidemic typhus in Mexico early this year. Since March, SMADEL and other research-workers from the U.S. Army and the University of Maryland have been collaborating with LEWTHWAITE and SAVOOR of Kuala Lumpur in a clinical trial in scrub typhus, and preliminary results were reported<sup>2</sup> at the International Congress on Tropical Medicine<sup>3</sup> at Washington, D.C., in May.

Scrub typhus, or tsutsugamushi fever, was one of the major medical problems of the Burma campaign. The disease is indigenous to a large part of tropical and subtropical Asia, but its extent was not realised until large numbers of troops were put into jungle previously unvisited by white men. It has long been recognised in Malaya, and much work has been done on it there by LEWTHWAITE and his colleagues at the Institute for Medical Research, Kuala Lumpur; so it is fitting that this institute was chosen as the headquarters of the trial. The vector of the disease is a

1. Ehrlich, J., Bartz, Q. R., Smith, R. M., Joslyn, D. A., Burkholder, P. R. *Science*, 1947, **106**, 417. See annotation, *Lancet*, 1947, ii, 952.
2. Smadel, J. E., Woodward, T. E., Ley, H. L. jun., Philip, C. B., Traub, R., Lewthwaite, R., Savor, S. R. Released by the Department of the Army, Technical Information Office, Washington, D.C.
3. See *Lancet*, May 29, p. 842.

mite, not unlike our own "harvester" that picnic parties encounter in the September corn stubble, but picked up in the tropics by walking through the lalang grass. The overgrown rubber plantations are now being cleared after the Japanese occupation, and the disease, always endemic, is being encountered again among the native workers. So far 25 patients have been treated with the drug, while a control group of 12 untreated cases have been observed during the same period. The treated and untreated come from the same areas and in some cases from the same plantations, so the strains of *R. tsutsugamushi* are likely to be of similar virulence. The mean ages of the two groups—an important factor in any typhus infection—were the same. The diagnosis was proved in each instance, either by recovering the rickettsia from the blood or by demonstrating satisfactory titres for agglutination against an OXK strain of *Proteus*. In the treated group nobody developed complications or died; the average duration of fever after the first dose was 31 hours, and the average total

febrile period 7.5 days; one man, treated on the 3rd day of the disease, was discharged for light work on the 9th day after onset. In the untreated group of 12, 2 patients developed serious complications and 1 of these died, while the mean duration of fever was 18.1 days. The chloromycetin was given by mouth, initially in large doses; but these were gradually reduced, and the last 7 cases were given the drug for only 24 hours, receiving a total of 6 g., with an equally satisfactory response. Half the patients were treated on estate hospitals where nursing conditions are necessarily somewhat primitive.

To those who have had experience of scrub typhus in the Burma campaign these results will be more than striking; they will alter the whole picture of a disease. From the laboratory work it is not too much to hope that this new antibiotic will prove equally effective against other rickettsial diseases. If so, the future history of the typhus group of diseases will depend on how far the demand for chloromycetin can be met.

## Annotations

### TREATMENT OF ARTERIAL EMBOLISM

ARTERIAL embolism is a complication of cardiac or vascular disease, and its effects depend on the site and size of the embolus as well as on the severity of the primary disease. The variation of these three factors offers such a formidable range of combinations that any statistical analysis of the results of treatment is almost foredoomed to failure. A surgeon who is called in during the course of a disabling disease to treat a complication may be forgiven some preoccupation with that complication, but his claims for the value of treatment must be based on their effect on the patient as a whole. In the case of embolism affecting a limb artery the surgeon's aim is usually to save the limb, and there is a tendency to assess results purely on the rate of limb survival without reference to its usefulness to the patient.

Warren and Linton,<sup>1</sup> analysing experience of arterial embolism at the Massachusetts General Hospital, conclude that arterial embolectomy is the treatment of choice in embolism of a peripheral artery, mainly on the grounds that the cases operated on show a higher proportion of limb survival than those treated by conservative methods. It is difficult to judge the validity of their claim because it is not clear what determined the choice between operation and other methods, but since all surgeons insist on the importance of the time interval it is reasonable to suppose that this plays some part in selection. Apart from one case operated on at 60 hours, their longest interval between onset and operation was 11 hours. It must also be supposed that the patient's general condition was also a criterion in selection, though it is recorded that two patients selected for surgery died on their way to the operating-theatre. If any useful comparison is to be made between surgery and conservative treatment, both should be tried in the most favourable cases—i.e., those with a brief interval since the embolism and a reasonable prognosis for the cardiac condition. Experimental work on heparin encourages the view that this should be the treatment of choice, since it has been shown by Rabinowitch and Pines<sup>2</sup> and confirmed by Loewe et al.<sup>3</sup> that heparin not only prevents thrombosis but also assists in the resolution of clot already formed. The secondary coagulation

thrombosis extending peripherally after embolism is the chief obstacle to the success of embolectomy. The combination of surgery and heparin is attractive in theory but hazardous in practice. The patient naturally abhors amputation, but this may sometimes be the most humane treatment even when there is a chance that the limb can be saved. There have been very few long survivals of an affected limb after embolectomy, and still fewer with a symptomless limb. The embolism itself carries a risk to life because of the poor state of the patient. Warren and Linton report a case-mortality of 38.7% (but this includes embolism in sites other than limbs) and quote other rates of 50% and over.

Whatever pleas are made for special forms of treatment it is clear that none has any outstanding advantage over the others. The choice of treatment at present must be an individual one, and it must depend on the prognosis of the cardiac disease and on the prospect of the future usefulness of the limb.

### CANCER IN CHILDREN

CANCER, in general, is a disease of the elderly, but it sometimes appears in a child, and the doctor's philosophy and understanding may then be strained to the utmost. Often no cure is possible from the first, the miseries of the child are hard for parents to bear, and symptomatic relief may be temporary and incomplete. A small gleam of light is provided by Dargeon,<sup>1</sup> of New York, in a paper sponsored by the American Medical Association and the American Cancer Society. The importance of the subject can be gauged by the fact that in New York, in the three years 1942-44, "cancer and other tumours" accounted for 215 deaths in children, against 291 for tuberculosis, and in the U.S.A. as a whole "cancer and allied diseases" was the third highest cause of death between 3 and 10 years, and the sixth at 10-14 years. The commonest sites for juvenile cancer are the bones, kidneys, eye and orbit, and the lymphatic and blood-forming organs; tumours may also arise in the nervous system, muscle, and other connective tissues. The detailed recognition and management of these different kinds of new growth are systematically described by Dargeon, and he emphasises the fact that although many of the tumours have an unfavourable prognosis from the beginning, this is not an invariable rule—for example, osteochondromas and giant-cell tumours of bone only become malignant with the advance of time; there have been several instances

1. Warren, R., Linton, R. R. *New Engl. J. Med.* 1948, 238, 421.  
2. Rabinowitch, I., Pines, B. *Surgery*, 1943, 14, 669.  
3. Loewe, L., Hirsch, E., Grayzel, D.M. *Ibid.*, 1947, 22, 746.

1. Dargeon, H. W. *J. Amer. med. Ass.* 1948, 136, 459.

of children surviving for more than ten years after treatment for cancer of bone. Our general attitude toward so-called benign tumours, he thinks, should be revised without delay.

The universal desideratum is early and correct diagnosis, followed immediately by suitable treatment; the sooner surgical operations are done, the less mutilating they are likely to be and the better the chances of permanent cure. To secure quick recognition, Dargeon recommends that every child should be examined monthly during the first year, quarterly from 1 to 6 years, and every six months thereafter. Biopsy should be done at once on every swelling of non-traumatic origin, as well as on those which, though following injury, have persisted unusually long; all potentially malignant growths, including melanomas, teratomas, dermoids, and neuromas, ought to be excised without delay. Even an atypical symptom-complex demands thorough investigation, for the cause may be a hitherto undetected neoplasm. The essential change required is that doctors examining children should keep malignant disease in mind as a possibility and not exclude it automatically on grounds of age.

### SAFETY IN SHELL-FISH

THERE is no legal standard in this country for the bacteriological cleanliness of shell-fish. Most of the popular types are cooked, but oysters and sometimes mussels are eaten raw. In fifteen years there are said to have been over 100,000 cases of typhoid fever in France caused by contaminated shell-fish, and we have had large outbreaks in this country from this cause. There is less evidence that other types of salmonella infection are conveyed in this way, possibly because the infecting dose of bacteria is considerably greater than in typhoid fever. But shell-fish are now being eaten by more people than ever before and many medical officers of health feel that a bacteriological safeguard is needed. Ever since Captain Vancouver's men landed in Poison Cove on the Pacific Coast of Canada mussels have been known to cause a severe type of paralytic food-poisoning, and such places as the Bay of Fundy are out of bounds to the fisherman for this reason. The source of the paralytic poison is a species of dino-flagellate on which the mussels feed, and ordinary methods of cooking may not destroy the poison. In the British Isles the chief danger is typhoid fever, for many of our shell-fish lays are in estuaries where raw sewage enters the sea or on shores swept by heavily polluted tidal water. In a four-hour shift an oyster can filter some two gallons of sea-water, and pathogenic organisms may be filtered off and left behind in its gut. It has been shown that shell-fish can be made safe by treating them in chlorinated sea-water, and this method is likely to be widely used. The bacteriological control of shell-fish for human consumption depends on counting numbers of coliform bacilli—a test which appears simple and accurate but is technically difficult and misleading. Of the many standards used, that of the Fishmongers' Company allows about 100 coliform organisms per oyster in 40% of the specimens examined. A more satisfactory test has now been suggested by Clegg and Sherwood,<sup>1</sup> who measure the degree of contamination by faecal coli in a single test which does not require subsequent confirmation. They inoculate roll-tubes of a modified MacConkey agar with material from the shell-fish and incubate the tubes at 44°C, a temperature which inhibits the non-faecal coli. If four out of five samples from the same source are free from faecal coli in 1 ml. quantities of tissue such shell-fish are said to be fit for food. If there are two or three faecal coli per ml. of shell-fish in any sample further

investigation is required. This suggested standard will not be easy to reach unless the newer methods of shell-fish purification are used, but outbreaks of infection from shell-fish will continue unless some such standard is adopted and enforced. Those who do their own cockling will no doubt ignore bacteriological standards, but the rest of us will be happier if we know that our oysters and mussels are free from faecal contamination.

### PLAIN ENGLISH

A SERIOUS effort is being made to improve the standard of written English, especially to clear away the verbiage with which official and commercial phraseology befog plain meaning. Mr. Churchill expressed it all in a characteristically forceful way when he said: "this is the sort of English up with which I will not put."

Government departments today have much more direct contact with the general public than they had ten years ago; they circulate to every citizen information and directions about social services and about all the unpleasant restrictions that are still with us; their officials have to write innumerable letters to members of the public as well as to other officials. The ordinary citizen who receives a letter of the "I am directed . . . I am to add . . ." type tends to throw it straight into the wastepaper basket, and this habit has become known in Whitehall. The daily press have not been tardy in emphasising the sense of despair produced by the attempt to get any meaning at all from the slabs of jargon that some Ministries issue as directions or "explanations." In the *Observer* Mr. Frank Watkins<sup>1</sup> has pleaded for putting business English in order. He would like to see an end of same, inst., prox., and ult., herewith, favour, and all the jargon of opening and closing phrases that make most business letters "at least one-tenth too long."

Several important Government departments have made a real effort to rid their pamphlets and letters of jargon and to say quite clearly—when the Minister has any clear ideas—what they want; the explanatory leaflet that comes with the income-tax assessment form is a notable example of successful redrafting. The Treasury asked Sir Ernest Gowers to write, for the benefit of civil servants, an up-to-date guide to the use of English, and this has now been published in a booklet entitled *Plain Words*.<sup>2</sup> It is primarily designed for officials, and most of the examples—good and bad—are taken from official sources. On the first page there is a quotation from Robert Louis Stevenson: "The difficulty is not to write but to write what you mean, not to affect your reader, but to affect him precisely as you wish." The solution of this difficulty is the theme of the book. And it is of vital interest not only to officials but also to every doctor who writes letters or sends articles to the press. Not everyone has the time to study Fowler's *Modern English Usage*, but no doctor, however experienced, will fail to benefit from studying the 94 pages of *Plain Words*. In fact he will find (on page 30) a special reference to the medical profession who, it appears, are becoming increasingly addicted to "puddery." Pudder is a disease contracted in early manhood and leads the victim to write phrases like "concerned with the aetiology of the disease and with prescribing some general regimen. . . ." If we look about, most of us will find some symptom of the disease in our own writings.

Sir Ernest Gowers deals sensibly with the split infinitive, the preposition at the end, the use of dashes, and other punctuation troubles. He points out many signs of slovenly thinking and writing that have crept into technical and official writing: "It may safely be said that the design of sanitary fittings has now reached a high degree of perfection" (qualification of an absolute); "These claims are of a very far-reaching character"

1. May 23, 1948.

2. H.M. Stationery Office. 1948. Pp. 94. 2s.

1. Clegg, L. F. L., Sherwood, H. P. *J. Hyg., Camb.* 1948, 45, 504.

(unnecessary abstract adjectival phrase). He has made an instructive list of overworked words that are often wrongly used and he gives their alternatives. One would like to see a copy of his readable and often humorous guide on the desk of every official drafting the regulations for the National Health Service. Judging by the pensions regulations, the lessons of *Plain Words* have yet to be learnt in some departments.

#### INFANTILE METHÆMOGLOBINÆMIA FROM DRINKING-WATER

CYANOSIS is usually produced by reduced hæmoglobin in the subpapillary venous plexuses of the skin,<sup>1</sup> but when it occurs without cardiac or pulmonary disease the presence of methæmoglobin or sulphæmoglobin in the blood must be considered. Since 1945 reports have been appearing in the North American pædiatric and public-health journals of a cyanotic syndrome in infants due to methæmoglobinæmia. This condition is caused by the ingestion of water derived from rural wells and containing more than 10–20 parts per million of nitrate ions, a concentration which Comly<sup>2</sup> looks upon as the maximum for waters which can safely be used for infant feeding. The nitrate ion is transformed by intestinal bacteria into nitrite and this is absorbed and converts some of the circulating hæmoglobin into methæmoglobin. The nitrates which find their way into the well water are formed by the action of soil bacteria on nitrogen compounds present in fertile humus. The wells are usually rather shallow and inefficiently lined. Waters containing large amounts of nitrate are reported by Weart<sup>3</sup> from various areas of the United States, Canada, England, and Belgium, and Weart has found no correlation between the nitrate content of well waters and their contamination with coliform bacteria.

That nitrates can be responsible for methæmoglobinæmia has been known since the introduction of bismuth subnitrate in radiology. Death has been reported<sup>4</sup> after the administration of bismuth subnitrate for the treatment of diarrhœa in a young infant. The nitrates share their property of the intracorporeal production of methæmoglobin with coal-tar derivatives, such as are used in the manufacture of aniline dyes and explosives, and with various drugs such as acetanilide, antipyrin, phenacetin, potassium chlorate, and sulphonamides. Extracorporeal methæmoglobinæmia is found in phenylhydrazine poisoning and in severe infections (*Cl. welchii*). Some of these drugs may cause sulphæmoglobinæmia if an excess of sulphide is present in the gastro-intestinal tract. In "enterogenous cyanosis" the abnormal pigment is found in the red blood-cells even if no drug has been taken.<sup>5</sup> It is suggested that this condition is due to excessive nitrate production in the gastro-intestinal tract. There are a few cases on record of idiopathic familial methæmoglobinæmia with cyanosis, possibly due to a congenital metabolic error<sup>6</sup>; these cases respond to large doses of ascorbic acid by mouth.

Nitrate methæmoglobinæmia is much more common in infants than in adults. Of the various possible reasons for this, the relatively large intake of water in infancy is probably the most important; others are the presence of smaller amounts of oxidisable hæmoglobin in the infant's blood; the more ready absorption of nitrites in the infant's gut and possibly a larger formation of nitrites due to differences in bacterial flora; and poor elimination by the immature infantile kidney. Ascorbic acid in the blood may counteract the action of nitrites on hæmoglobin,<sup>7</sup> and depletion of ascorbic acid may

account for the rapid development of cyanosis after an infant has been taking a high nitrate water for some time. The clinical picture is one of cyanosis and occasional drowsiness, often with gastro-intestinal disturbances; the condition may be fatal in consequence of anoxæmia. In the State of Illinois Weart has learnt of 33 cases of nitrate cyanosis in the last year, with 5 deaths. The symptoms are said to be quickly relieved by the intravenous administration of methylene-blue (1–2 mg. per kg. body-weight) and exclusion from the diet of the offending water, so presumably the condition is only dangerous if it is unsuspected.

#### THE BIRTHDAY HONOURS

THE first name in the list of honours gazetted last week is that of Sir Alfred Webb-Johnson, who is created a baron. His many friends will be happy that his work is thus recognised, and the profession as a whole will be glad to have another able representative in the House of Lords. It cannot have escaped notice that Sir Alfred is a specialist in restoring vigour to ancient institutions: he is largely responsible for the new Middlesex Hospital, and under his presidency in the difficult years since 1941 the Royal College of Surgeons has become once more a great and developing centre of teaching, full of activity and hope. The president of a sister college is also honoured, and much pleasure will be given to his colleagues by the knighthood now bestowed on Mr. William Gilliatt, obstetric and gynaecological surgeon to King's College Hospital. Air Vice-Marshal A. F. Rook is promoted K.B.E. for his distinguished service as consultant in medicine to the Royal Air Force, and the new knights also include Mr. J. N. Morris, F.R.A.C.S., Dr. D. T. Rocyn-Jones, formerly medical officer of health for Monmouthshire, and, outside the nominal confines of the medical profession, Mr. Charles Harington, D.Sc., F.R.S., director of the National Institute of Medical Research. To these and many others mentioned on another page we offer warm congratulations.

#### A MONOPOLY?

IN a letter this week Mr. E. R. Desoutter, on behalf of the Surgical Instrument Manufacturers' Association, calls attention to the decision that in the National Health Service artificial limbs will be supplied only through the Ministry of Pensions, which will obtain them all from two contractors. This means, he says, that most of the private firms making artificial limbs are threatened with extinction; and it has already been announced that his own firm, Desoutter Bros. Ltd., has been obliged to discontinue this work. In Tuesday's *Times*, Prof. H. J. Seddon, F.R.C.S., recalls the departmental committee's recommendation that "no action shall be taken by the Government which would have the effect of gradually forcing out of business those firms which do not supply the Government." He appears to be right in saying that "unless the present plan is changed an almost complete and a very unhealthy monopoly will be created."

#### SPENS REPORT AND REPRESENTATION OF SPECIALISTS

A MEETING held on June 14 at the Royal College of Physicians was attended by 59 consultants and specialists, including representatives of the three Royal Colleges, the Scottish Medical Corporations, all the specialties, and the Provincial Teaching Hospitals Association. The following resolutions were passed unanimously:

- (i) This meeting approves in principle the Spens report, recommends its adoption, and hopes the Government will implement it.
- (ii) This committee should continue in existence in order to consider matters which concern consultants and specialists.

1. *Lancet*, 1947, ii, 431.

2. Comly, H. H. *J. Amer. med. Ass.*, 1945, 129, 112.

3. Weart, J. G. Paper presented at the American Chemical Society meeting of April 19, 1948.

4. Roc, H. E. *J. Amer. med. Ass.* 1933, 101, 352.

5. Stokvis, B. J. *Ned. Tijdschr. Geneesk.* 1902, 2, 678.

6. Denny, J., Murdoch, E. T., Rogan, J. J. *Brit. med. J.* 1943, i, 721.

7. Carrick, M., Polis, B. D., Klein, T. *Arch. intern. Med.* 1946, 76, 296.

## Special Articles

**THE RECORDING OF  
PSYCHOTHERAPEUTIC SESSIONS  
ITS VALUE IN TEACHING, RESEARCH, AND  
TREATMENT**

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MEMORIAL HOSPITALS

THE teaching of psychotherapy has always been difficult, mainly because the intimate nature of the work makes it impossible for any other person to be present with the patient and the psychotherapist. The treatment is not an exact science where all possible factors can be known previously and remedies prescribed as in an obvious physical illness. Psychotherapy is to a great degree an art; therefore long experience is needed. Many mistakes arise, often proving to be the milestones in learning how to give treatment.

The different schools of psycho-analysis overcome the teaching difficulty by demanding that every psychotherapist who practises analysis should first be analysed. This takes from two to five years and is very expensive; hence few have the opportunity for it. Even if the psychotherapist has been through a long analysis, it does not follow that he is qualified to use a short-term method of psychotherapy. Some will gain extra insight and therefore will be able to use short methods, but others will be more loth to use any other method than that which they have learnt themselves. Book knowledge alone has helped the potential psychotherapist even less than it does the man who wants to become a craftsman but has never seen either his materials or tools.

The demand for psychotherapy has grown steadily during and since the war, and the number of doctors who want to train as psychotherapists is greater than it has ever been. The problem of finding better methods of teaching has therefore become urgent.

The problem of research in psychotherapy is just as urgent and difficult as that of teaching: the intimate nature, the impossibility of repeating experiments under exactly the same conditions, and the subjective nature of the work make research very difficult.

METHOD

We understand that the mechanical recording of psychiatric and psycho-analytic interviews has been carried out in the U.S.A.; but, so far as we are aware, no reports have been published on the subject in this country or in America on the technique we use. This work was first planned in 1939 but had to be postponed because of shortage of staff and the difficulty in getting apparatus under war-time conditions.

We have been using a magnetic steel wire recording apparatus of the Wirek Electronic Firm, which has the advantage of being able to take an uninterrupted recording for about an hour. It is portable and therefore can be used in hospital, outpatient department, and consulting-room.

The machine is for 230 volts A.C. It is advisable to use a transformer for any other voltage; if not, the wire is apt to slip and the recording is spoilt. Once the wire gets entangled, it is extremely difficult to save the record. If the wire snaps, a simple knot can be used to join it, and the recording is not affected. This has a great advantage in selecting and compiling different

pieces from various records for a lecture. The wire has the advantage that each single spool can be used again for recording for an indefinite number of times after demagnetisation. Further, each spool can be replayed as often as is desired.

There are several technical difficulties. The microphone is not very sensitive; therefore it is not easy to get a continuous and even recording in each case, especially when the patient is unaware of the recording. A more sensitive microphone (or two microphones) would, we believe, assist in overcoming this difficulty. We tried at first to overcome this drawback by asking the patient to sit at one side of the corner of a table while the examining psychiatrist sat at the other side of the corner, the apparatus being looked after by another member of the team in another room.

Other disadvantages we experienced at first were that the door could not be shut properly because of the wire connecting the microphone to the apparatus; and we could not stop or start the apparatus without arousing the suspicion of the patient, already suspicious because of being interviewed in a room other than the ward. This was necessary because the apparatus works only on A.C., whereas most of the wards of this hospital are on D.C. We have overcome this difficulty by making the patient lie down and by having the microphone and the wires built into a bed-table. The wire to the apparatus, which is in the adjoining room, passes through a small aperture invisible to the patient.

We have recorded diagnostic interviews and psychotherapeutic sessions with and without the patients' knowledge. So far we have not met resistance in patients who knew they were being recorded; on the contrary, most of them were pleased to do it.

TEACHING AND RESEARCH

When we played records to medical audiences, the general opinion was that these records gave a clear picture of what happens in a psychotherapeutic session. They gave not only exact reproductions of the content but also exact impressions of the atmosphere, which might be even more important. Some thought that this might become the method of choice for teaching short-term psychotherapy and short-term psycho-analysis.

The recording machine enables one to measure, examine, and re-examine. It enables one to compare the different methods of approach in the work of various psychiatrists. The records contribute not a little to the psychiatrist's ability to analyse himself and to criticise his own methods.

TREATMENT

While investigating methods of teaching and research we found new methods of treatment which seemed worth following up.

*Abreaction.*—The machine can be used to record the abreaction of a patient's aggression while he is too inhibited to do it in the presence of the psychotherapist. One young schizothyme asked the psychotherapist to leave the room and let him have his "box" alone. It was interesting to see how much aggressive material the patient produced when he was unhampered by the presence of the psychotherapist. There seem to be several possible developments in this direction.

*Re-enacting.*—Experiments were made with patients who could not control their tempers. The patient was put before the microphone and asked to reproduce some of the scenes in which he had lost his temper lately. It appeared that the objectivisation of these very subjective scenes produced a different attitude in the patient towards the scene.

*Re-experiences.*—In any method of psychotherapy, short of orthodox psycho-analysis, the psychotherapist plays a more active rôle, which often increases the

patient's resistance. To overcome this, we can confront the patient with his own statements by playing back to him selections from former interviews. This is especially useful where the patient forgets easily and is inclined to change rather often. One can, if need be, play back a whole session; this has in several cases released associations. By this method the period of treatment can be shortened. We asked an intelligent patient to analyse his own record and especially to note the places where he hesitated, stammered, or stopped. He was baffled by his findings and could not put up any resistance to them, because they were his and not those of the psychiatrist. He tried to rationalise them but did not succeed.

**Confrontation.**—Abreaction with 'Sodium amytal' and with soluble thiopentone, thus bringing to the surface subconscious material, has been used extensively, especially during the war. While we were recording the patient's observations and answers under narco-analysis we thought of confronting the patient after the session with his own subconscious material. So far we have had some puzzling results and we feel that a wide field for research lies in this direction. One patient, who produced horrible experiences of bombing, was clearly shocked when the material was played back to her. We have not yet been able to determine the precise reaction in the long run—i.e., whether one of psychological shock, abreaction, or any other form. The confrontation with one's own subconscious and the association or dissociation with it provides an interesting field for research and might easily constitute a new form of treatment. It might, at the same time, prove a great danger; therefore expert handling is advisable, especially in this early stage of research.

#### SUMMARY

Experiments have been made in recording diagnostic and psychotherapeutic sessions by means of a magnetic steel wire recording apparatus.

This technique provides new forms of teaching, research, and treatment, which are described.

We wish to thank Dr. S. L. Last for his helpful suggestions and Dr. H. Bevan Jones for his assistance in carrying out the experiments.

## PROVINCIAL TEACHING HOSPITALS

### BOARDS OF GOVERNORS

THE Minister of Health has now constituted a board of governors for each of the 10 groups of teaching hospitals in the provinces. On each board 5 members have been nominated by the university with which the group is associated, 5 by the regional hospital board for the area, and 5 by the medical and dental teaching staff of the group.

Roughly a third of the members will retire each year, and the following list shows the names printed in three groups: (a) those retiring in March, 1950; (b) those retiring in March, 1951; (c) those retiring in March, 1952. (The chairman will hold office till March, 1951.) The names of medical members are shown in bold type.

#### UNITED NEWCASTLE-UPON-TYNE HOSPITALS

*Chairman*: N. D. Newall, O.B.E., J.P.

(a) Prof. **R. V. Bradlaw**, M.R.C.S., F.D.S.; Alderman John Chapman; Edward Colgan; E. F. Collingwood, C.B.E., J.P.; **H. H. Evers**, F.R.C.O.G.; F. B. Fenwick; Prof. **R. B. Green**, F.R.C.S.; Prof. **F. J. Natrass**, F.R.C.P.; John Walmsley; T. A. Wright.

(b) William Allan; Viscount Allendale, C.B.E., M.C.; Alderman P. S. Hancock, O.B.E.; W. Stanley Mitcalfe, M.C.; Robert Muckle; Rt. Hon. Lord Eustace Percy; Viscountess Ridley, J.P.; Sir Walter Thompson, J.P.

(c) T. H. Bates, M.D., J.P.; Norleigh Booth; **S. W. Davidson**, F.R.C.P.; Alderman N. Garrow, J.P.; **John Gilmour**, F.R.C.S.; Sir Mark Hodgson, O.B.E., J.P.; W. D. Lockey, J.P.; Prof. **J. C. Spence**, M.C., F.R.C.P.; Alderman Miss Margery Taylor, O.B.E., J.P.; Sam Usher.

#### UNITED LEEDS HOSPITALS

*Chairman*: Sir George Martin, K.B.E., J.P.

(a) Alderman David Beever, J.P.; Prof. **A. M. Claye**, F.R.C.O.G.; W. M. Jones; Miss Elinor Lupton, J.P.; Prof. **William MacAdam**, F.R.C.P.; Prof. **T. T. Read**, F.R.F.P.S., L.D.S.; **J. E. Rusby**, M.C., L.M.S.S.A.; Prof. A. N. Shimmin,

(b) Prof. **Digby Chamberlain**, F.R.C.S.; M. R. Hollings. B.CH.D.; J. C. Hunter; W. W. Powell; Rev. Canon A. S. Reeve; L. Richmond, C.B.E.; Mrs. I. Barbara Shaw; Richard Wheeler, J.P.; Alderman Joseph Wilkinson, J.P.

(c) J. W. Booth; J. E. Fattorini; F. J. Higginson; **J. T. Ingram**, F.R.C.P.; B. M. Jones, D.S.O.; **L. N. Pyrah**, F.R.C.S.; **H. A. Ryott**; Prof. **Matthew Stewart**, F.R.C.P.; Mark Whittock.

#### UNITED SHEFFIELD HOSPITALS

*Chairman*: A. Ballard.

(a) Alderman Alfred Buxton, J.P.; E. T. Lemmon; J. Madin, J.P.; Percy Malby; A. R. Martin; J. I. O. Masson, M.B.E.; Theophilus Pearson; **H. R. Vickers**, M.R.C.P.; T. G. Sorby; Prof. **E. J. Wayne**, F.R.C.P.

(b) J. V. Bibby, D.S.O.; Malcolm Brown; Mrs. Gladys Buxton, J.P.; **J. L. A. Grout**, M.C., F.R.C.S.E.; Alderman Percy Judd; **Balfour McKean**, M.D.; F. M. Osborn; **L. B. Patrick**, F.R.C.S.E.; W. R. S. Stephenson; G. F. Young.

(c) E. A. Barker; Sir Basil Gibson, J.P.; **W. J. Lytle**, F.R.C.S.; **J. G. McCrie**, O.B.E., F.R.C.P.E.; Prof. **G. L. Roberts**, M.B., B.D.S.; Prof. **C. H. Stuart-Harris**, F.R.C.P.; Alderman Mrs. Grace Tebbutt; J. W. Trickett, J.P.

#### UNITED CAMBRIDGE HOSPITALS

*Chairman*: Thomas Knox-Shaw, M.C.

(a) Miss Anna Bidder; Lady Bragg, J.P.; Mrs. Ethel Hephner; G. F. Hickson; George Hawkins, O.B.E.; E. W. Plumpton, J.P.; Rev. Prof. C. E. Raven; **C. H. Whittle**, F.R.C.P.

(b) Mrs. Ena Binfield; Mrs. Eleanor Charvet; W. M. Francis; Alderman E. T. Halnan; **Oswald Lloyd**, F.R.C.S.; R. H. Parker, M.C.; Alderman Mrs. Emily Parsons; **A. S. H. Walford**, F.R.C.S.; Rt. Hon. H. U. Willink, M.C.

(c) S. O. Chivers, C.B.E.; **L. B. Cole**, F.R.C.P.; Prof. **H. R. Dean**, F.R.C.P.; P. F. Dennard; Alderman **Robert Ellis**, M.D.; S. G. Newman; **V. C. Pennell**, F.R.C.S.; H. J. Pye; A. L. Symonds, M.B.E., M.P.; Sir **Lionel Whitby**, F.R.C.P.

#### UNITED OXFORD HOSPITALS

*Chairman*: E. C. Bevers, F.R.C.S.

(a) **C. W. Carter**, B.M.; Arthur Elliot-Smith; Percy Gillians; Alderman Mrs. **Isabella Harrison-Hall**, M.B., J.P.; A. F. King; **R. G. Macbeth**, F.R.C.S.E.; L. V. Murphy; Miss Rosemary Spooner; **A. Q. Wells**, D.M.

(b) **E. M. Buzzard**, M.R.C.P.; Sir Henry Clay; Prof. **A. D. Gardner**, F.R.C.S.; J. J. Johnson, C.B.E.; A. W. H. B. King; **J. C. Scott**, F.R.C.S.; E. A. Smewin, J.P.; R. F. Symonds, O.B.E.; **Janet Vaughan**, O.B.E., F.R.C.P.; **J. C. Wharton**, M.R.C.S.

(c) L. B. G. Bellinger; Sir **Hugh Cairns**, F.R.C.S.; **A. M. Cooke**, F.R.C.P.; H. A. Goddard; G. E. C. Holt; W. R. Robins, J.P.; John Thomson; Alderman Lady Townsend, J.P.; Prof. **L. J. Witts**, F.R.C.P.

#### UNITED BRISTOL HOSPITALS

*Chairman*: C. C. Clarke.

(a) Prof. **A. I. Darling**, M.R.C.S., M.D.S.; P. W. Hort; Miss I. M. Lobb; Alderman J. J. Milton, J.P.; Sir Philip Morris, C.B.E.; **A. G. Palin**, F.R.C.S.E.; Lady Sinclair; H. B. Stokes; Miss Helen Strimer.

(b) G. C. Bennett; G. T. Biggs, D.S.O.; Prof. **R. J. Brocklehurst**, D.M.; G. T. Bullock, M.B.E.; Prof. **A. V. Neale**, F.R.C.P.; Rev. K. L. Parry; **S. K. Rigg**, L.R.C.P.E., L.D.S.; **H. L. Shepherd**, F.R.C.O.G.; Lady Wills, J.P.

(c) G. A. W. Allan; Egbert Cadbury, D.S.C., D.F.C., J.P.; W. J. Carter; **G. M. Fitzgibbon**, F.R.C.S.; **J. H. Grove-White**, M.D.; **J. A. James**, F.R.C.S.; Prof. **R. H. Parry**, F.R.C.P.; Prof. **C. Bruce Perry**, F.R.C.P.; H. G. Tanner, J.P.

#### UNITED CARDIFF HOSPITALS

*Chairman*: G. D. Shepherd, M.B.E., J.P.

(a) Alderman Joseph Dicks; **D. B. E. Foster**, F.R.C.S.E.; Alderman James Griffiths, J.P.; A. S. W. Johnson, J.P.; Sir **Ewen Maclean**, F.R.C.O.G., J.P.; S. R. Marsh; E. V. Rogers; E. E. Tompkins, J.P.; **A. G. Watkins**, F.R.C.P.

(b) Alderman Sydney Jones; **R. D. Owen**, F.R.C.S.E.; Alderman O. C. Purnell, C.B.E., J.P.; Alderman Mrs. Dorothy Rees; Alderman R. G. Robinson, J.P.; Prof. **G. I. Strachan**, F.R.C.O.G.; Ernest Tear, J.P.; Sir Ivor Thomas, J.P.; **J. W. Tudor Thomas**, F.R.C.S.; Alderman Rev. W. D. Thomas.

(c) Sir Frederick Alban, C.B.E., J.P.; Mrs. Helena Evans; Harold Finch; Prof. Jethro Gough, M.D.; C. J. Hardwicke; Sidney Mitchell; Prof. R. M. F. Picken, M.B.; Sir Willie Reardon-Smith, J.P.; T. R. Rees, M.R.C.S.; Prof. Lambert Rogers, F.R.C.S.

## UNITED BIRMINGHAM HOSPITALS

Chairman: S. F. Burman, M.B.E.

(a) George Ball; Alderman A. F. Bradbeer; D. Bulgin; Prof. P. C. P. Cloake, F.R.C.P.; J. F. Crowder; Alderman Mrs. Elsie May Farley, J.P.; Prof. H. F. Humphreys, O.B.E., M.C., M.B., M.D.S.; R. E. Priestley, M.C.; Alderman A. J. Stanley.

(b) A. L. d'Abreu, O.B.E., F.R.C.S.; Miss E. M. Barling, M.B.E.; T. A. H. Baynes, J.P.; Alderman W. T. Bowen; C. L. Chatwin; Alderman W. L. Dingley; V. W. Grosvenor, J.P.; Prof. Hilda Lloyd, F.R.C.O.G.; W. H. Newton; W. J. Simpson.

(c) R. R. Adam; Arthur Beauchamp, M.B.; Keith Mindelsohn; Mrs. Helen Murtagh; Sir Leonard Parsons, F.R.C.P., F.R.S.; T. Patterson; B. T. Rose, F.R.C.S.; Mrs. Rachel Smith; Prof. A. P. Thomson, F.R.C.P.; E. W. Vincent.

## UNITED MANCHESTER HOSPITALS

Chairman: C. M. Skinner.

(a) Mrs. Jean Currier; O. M. Duthie, M.D.; Alderman Joseph Eastham, J.P.; E. C. C. Evans, M.B.E.; G. H. Goulden; Graham Halbert; Prof. H. S. Raper, C.B.E., F.R.C.P., F.R.S.; Sir John Stopford, F.R.C.P., F.R.S.; Prof. F. C. Wilkinson, M.D., F.D.S.

(b) William Brockbank, F.R.C.P.; Percy Chadwick, J.P.; Mrs. Mabel Evans, J.P.; T. M. Larrad, J.P.; Harry Lord; Sir Harry Platt, F.R.C.S.; Prof. W. J. Pugh, O.B.E.; James Sillavan; Prof. Andrew Topping, F.R.C.P.; The Very Reverend Garfield Hodder Williams, O.B.E., M.B.

(c) N. M. Agnew; William Chadwick; E. A. Gerrard, F.R.C.O.G.; S. H. Hampson, M.C., M.B.E., J.P.; K. G. Holden; R. L. Holt, O.B.E., F.R.C.S.; Joseph Kershaw; R. L. Newell, F.R.C.S.; William Onions, J.P.; Prof. Robert Platt, F.R.C.P.

## UNITED LIVERPOOL HOSPITALS

Chairman: Sir Richard Armstrong.

(a) J. P. Bibby; Prof. Henry Cohen, F.R.C.P.; T. H. Herron; Miss Mary Jones, O.B.E.; Thomas Keeling, J.P.; George Leather, J.P.; Thomas McDonald; J. B. Oldham, F.R.C.S.; Prof. H. H. Stones, M.D., M.D.S.

(b) Mrs. D. Barton, M.B.E., J.P.; A. N. Denaro, M.B.E., J.P.; Miss Averill Eills, M.B.E., J.P.; Prof. W. M. Frazer, O.B.E., M.D.; Prof. T. N. A. Jeffcoate, F.R.C.O.G.; Alderman W. J. Lucas, J.P.; J. T. Morrison, O.B.E., F.R.C.S.; Prof. E. A. Owen, P. H. Whitaker, M.D.

(c) Frederick Bidston; Mrs. Elizabeth Braddock, J.P., M.P.; Prof. Norman Capon, F.R.C.P.; Robert Coope, F.R.O.P.; Mrs. A. Elliott, J.P.; A. A. Gemmell, M.C., F.R.C.O.G.; George Jennings; T. A. Jermy, M.B.; J. F. Mountford; Sir John Nicholson, C.I.E.; W. S. Rhodes, J.P.

## SCOTTISH HEALTH SERVICES COUNCIL

THE Secretary of State for Scotland has appointed the following to be members of the council:

Prof. DUGALD BAIRD, F.R.C.O.G.; Dr. A. D. BRIGGS; Sir HUMPHREY BROUN LINDSAY, D.S.O.; Prof. D. F. CAPPELL, M.D.; Dr. W. G. CLARK, D.P.H.; Mr. ALEXANDER CUNNINGHAM; Dr. R. C. SCOTT DOW, L.D.S.; Mr. C. G. DRUMMOND; Lieut.-Colonel J. C. DUNDAS, D.S.O.; Dr. MARY ESSELMONT; Mr. W. F. FERGUSON, F.H.A.; Miss JEAN P. FERLIE; Prof. G. B. FLEMING, M.B.E., F.R.F.P.S.G.; Dr. G. MATTHEW FYFE, D.P.H.; Mr. J. M. GRAHAM, F.R.C.S.E.; Prof. Sir DAVID HENDERSON, F.R.C.P.; Mr. JAMES F. HENDERSON; Miss C. McN. KEACHIE; Dr. J. R. LANGMUIR; Prof. J. R. LEARMONTH, C.B.E., F.R.C.S.E.; Mr. DAVID McCALL, PH.D., PH.C.; Dr. GEORGE MACFEAT, O.B.E.; Dr. I. H. MACIVER; Prof. J. W. McNEE, D.S.O., F.R.C.P.; Mr. JOHN MANN, C.B.E.; Miss E. G. MANNERS; Dr. A. F. WILKIE MILLAR; Mr. WILLIAM O'NEILL; Mr. THOMAS RANKIN, O.B.E., L.D.S.; Dr. T. FERGUSON RODGER, D.P.M.; Dr. W. D. D. SMALL, C.B.E.; Prof. SYDNEY A. SMITH, C.B.E., F.R.C.P.E.; Mr. JOSEPH STEEL; Mr. JAMES YOUNG; and Captain J. P. YOUNGER, C.B.E., D.L.

At its first meeting, on June 11, the council elected Sir Humphrey Broun Lindsay, convener of East Lothian County Council, as its chairman, and Prof. Sydney Smith as its vice-chairman. Dr. E. R. C. Walker, Scottish secretary of the British Medical Association, was appointed to act as joint secretary with Mr. T. D. Haddow, of the Department of Health for Scotland.

## BIRTHDAY HONOURS

THE list of honours announced last week contains the names of the following members of the medical profession:

## Baron

Sir ALFRED WEBB-JOHNSON, BT., K.C.V.O., C.B.E., D.S.O., M.B. Vict.  
President of the Royal College of Surgeons of England since 1941.

## K.B.E. (Military)

Air Vice-Marshal ALAN FILMER ROOK, C.B., O.B.E., F.R.C.P., K.H.P.

## Knights Bachelor

WILLIAM GILLIATT, C.V.O., M.D., M.S. Lond., F.R.C.P., F.R.C.S. President of the Royal College of Obstetricians and Gynaecologists.

JOHN NEWMAN MORRIS, C.M.G., M.B. Melb., F.B.A.C.S. Chairman of the National Council of the Australian Red Cross.

DAVID THOMAS ROOYN-JONES, C.B.E., M.B. Edin., J.P., D.L. For public services in South Wales.

## C.B. (Military)

Surgeon-Rear-Admiral OWEN DEANE BROWNFIELD, O.B.E., M.B. Lond., K.H.P.

Major-General JEREMIAH JOHN MAGNER, M.C., M.B. N.U.I.

## C.B. (Civil)

CHRISTOPHER FRANK GOOD, M.R.C.S. Principal medical officer, insurance medical service, Ministry of Health.

## C.M.G.

JOHN CECIL RANKIN BUCHANAN, M.D. Edin., F.R.C.P.E. Director of medical services, Fiji, and inspector-general, South Pacific health service.

PERCY STOCKS, M.D. Camb., F.R.C.P. Chief statistician (medical), General Register Office.

## C.B.E. (Military)

Surgeon Captain FREDERICK GEORGE HUNT, M.B. N.U.I. Air Commodore ERIC ALFRED LUMLEY, M.C., M.B. Dubl.

## C.B.E. (Civil)

JOHN HENRY BIGGART, M.D., D.Sc. Belf. Professor of pathology and dean of the faculty of medicine, Queen's University, Belfast.

CHARLES SAMUEL CURTIS, M.D. Harvard. Medical director and superintendent, Newfoundland Medical Service.

FRANK ARNOLD GUNESKARA, O.B.E., M.R.C.S. Formerly officer commanding Ceylon Medical Corps.

EDWARD ROWLAND ALWORTH MEREWETHER, M.D. Durh., F.R.C.P. Senior medical inspector of factories, Ministry of Labour and National Service.

JOHN ERNEST ALFRED UNDERWOOD, M.B. Lond. Principal medical officer, Ministry of Education.

## O.B.E. (Civil)

WILLIAM DAVID BATHGATE, M.C., L.R.C.P.E. Superintendent, Hospital of the Edinburgh Medical Missionary Society, Nazareth, Palestine.

Miss AGNES ELIZABETH LLOYD BENNETT, M.B.E., M.D. Edin., B.Sc. Sydney. Medical practitioner in Wellington, New Zealand.

JOHN ROBERT BLAZE. Senior physician, General Hospital, Colombo.

PERCY LESLIE FOOTE, F.R.C.S.E. Superintendent, Buller Hospital, New Zealand.

JAMES JOHN JOSEPH GIRALDI, M.D. Brist. Physician, King George V Hospital, Gibraltar.

CHARLES NORMAN GRIFFIN, M.B.E., M.D. Federal senior medical officer, Leeward Islands.

WILLIAM ARTHUR EDWARD KARUNARATNE, M.D. Lond. Professor of pathology, General Hospital, Colombo.

SHANKAR DHONDO KARVE, M.B. Bombay. For public services in Kenya.

ROBERT KIRK, M.D. Glasg. Bacteriologist, Sudan Medical Service.

Mrs. ELIZABETH JOSEPHINE LE SUEUR, M.B. N.U.I. Medical Officer, Sarawak.

EDOWO AWUNOR RENNEN, M.B. Edin. Senior medical officer, Sierra Leone.

GEORGE FRANCIS THOMAS SAUNDERS, M.D. Dubl. Senior medical officer, Gold Coast.

THOMAS EDMONDSTON SAXBY, F.R.F.P.S.  
Medical practitioner, Unst, Shetland.

**O.B.E. (Honorary)**

LAWRENCE EKENG RICHARD HENSHAW, M.B.  
Medical Officer, Nigeria.

**M.B.E. (Civil)**

Miss SYBIL KATHLEEN BATLEY, M.R.C.S.  
Superintendent, Church Missionary Society, Onitsha,  
Nigeria.

GEORGE ERIC WARNER LACEY, M.B. Durh.  
Admiralty surgeon and agent, Woolwich.

## INTERNATIONAL MEDICAL CONGRESSES

SINCE the end of the war there has been renewed interest in international congresses for the exchange of information on medical subjects, particularly in parts of Europe that were cut off from communication with the rest of the world. Formidable difficulties stand in the way of convening such congresses—notably loss of contact with opposite numbers in other countries during the intervening ten years. Currency regulations, shortage of travel facilities, and general post-war inconveniences, though difficult, are perhaps less crippling than this loss of contact.

Early last year Dr. I. M. Zhukova, counsellor in the natural-sciences section of UNESCO, started an inquiry into the value of a Permanent Bureau for the Coördination of International Congresses of Medical Sciences; and in March, 1947, this was further considered at a small meeting held in Paris by representatives of a number of international medical organisations known to be planning congresses in the near future.

When the Interim Commission of the World Health Organisation started work the project became the joint interest of WHO and UNESCO, and at a further committee meeting in Paris last April decisions were taken which it is hoped will lead to the formation of the bureau by the end of this year.

This meeting was attended by representatives of the International Union against Venereal Diseases, the World Medical Association, the International Pædiatric Association, the International Society of Surgery, the International Union against Cancer, the International Congress of Radiology, the International Congress on Mental Health, and the International League against Rheumatism: the representative of the International Union against Tuberculosis was unfortunately unable to attend. Besides UNESCO and WHO representatives, observers were sent by the United Nations Social and Economic Council, and the World Refugee Organisation. Delegates from Great Britain were Dr. Ralston Paterson (International Congress of Radiology) and Dr. Kenneth Soddy (International Congress on Mental Health).

The functions suggested for the bureau include the following:

*Information and Assistance.*—(1) To collect information on all national or international organisations of a medical or paramedical nature, and on the congresses which they organise. (2) To give them all possible material assistance, especially as regards specialised conference services (staff, technical material) and travelling facilities. (3) To study methods of facilitating the transfer of funds needed by congress members. (4) To study and disseminate information on the technique of congresses.

*Coördination.*—(1) To suggest to international medical bodies appropriate dates and places for the holding of their congresses. (2) To make a special effort to group disciplines together. (3) To give financial assistance to the scientific work of congresses and make grants to congress members who particularly merit them. (4) To give grants to enable representatives of different disciplines to take part in congresses.

*Diffusion of Information.*—(1) To circulate information received. (2) To study the whole problem of the dissemination of medical knowledge, including the circulation of documents resulting from the work of the congresses.

International congresses are capable of doing much to increase knowledge and promote international under-

standing, but they also involve risks of misunderstanding. Much is hoped from this attempt by the United Nations specialised agencies to foster international relations in the medical world.

## FREE MEDICINES IN AUSTRALIA

FROM AN AUSTRALIAN CORRESPONDENT.

FROM June 1 medicines have been available free of cost to every patient in Australia. Under this scheme, however, drugs are obtainable only in accordance with a formulary; and the prescription must be written on a special form and dispensed by an approved chemist, who gets scale payments from the Commonwealth Treasury.

During the first week less than ten such prescriptions were dispensed. This is the culmination of five years of controversy between the government and the British Medical Association. The association's objections are:

1. Limitation of drugs and prescriptions to a formulary. This, they argue, interferes with a doctor's right to prescribe according to his professional judgment.

2. The use of a prescribed form. Doctors object to the terms associated with this, which include liability to a fine of up to £50 for such offences as not producing the forms when called upon to do so. Doctors are prepared to write prescriptions on their usual personal forms.

3. Inadequate representation of the B.M.A. on the committee responsible for revising and extending the formulary. Last year the government asked the association to propose modifications or extensions of the formulary, which was prepared in 1945. Proposals were accordingly submitted under 29 headings, each containing a number of items; none of these proposals has been included in the formulary.

Dr. John Hunter, general secretary of the federal council of the B.M.A., has summed up medical opinion in the words: "If it is desirable that medicine should be free, then all medicine should be free." Doctors throughout Australia have refused to accept delivery of the formulary and prescription forms. The formulary was sent by registered post; but doctors refused to sign for the packet, and it was returned to the sender (the health department). The prescription forms were next dispatched by ordinary letter mail. Doctors marked these "Return to Sender," and handed them back to the postman. The health department then had both documents delivered in a plain envelope by a large private firm of parcel-delivery contractors. The news soon spread, and delivery was again refused. The documents are now stacked in the State offices of the health department.

Last year the B.M.A. voiced its objection to the penal clauses, and offered to appoint a committee in each State to police and control the doctor's part in the scheme. The government promised to delete the penal clauses, but when the regulations finally emerged these clauses were still included. The association feels that the scheme concerns only the government, the chemists, and the public; and it cannot see the need for the regimentation of the profession which is implicit in the regulations.

The chemists, through the Federated Pharmaceutical Service Guild of Australia, have entered into a purely business contract with the government, and are not taking sides in the controversy; but the Brisbane Associated Friendly Societies Dispensary, representing 20,000 lodge members, refused to cooperate in the scheme because of the limitations of the formulary.

The public has, on the whole, been apathetic to the dispute. Some of the more militant trade unions have talked of a "doctors' strike," but there has been surprisingly little public protest. The government hopes that personal pressure by patients will force the profession to yield, but there has been little evidence of this; in any event patients would have to pay for most of their prescriptions, because of the restrictions of the formulary.



## In England Now

### A Running Commentary by Peripatetic Correspondents

ONE of the more noticeable results of the recent war is a general restlessness, a disinclination to settle down. I would hazard a guess that there are now far more correspondents who are genuinely peripatetic, for our vestigial wanderlust has a new lease of life. Professional uncertainties in the United Kingdom, together with the constant nagging stimulus of shortages, have prompted many of us to try our fortunes overseas. In some cases it has meant changing one uncertainty for another—many have jumped out of the authoritarian frying pan into the fire of robust free competition where the Devil inevitably catches up with the hindmost. Those who have no job to come to may find it far from easy to live even temporarily on the meagre allowance of their own capital which may be brought to dollar countries.

I feel sure, however, that most of the professional emigration is successful. I find it hard to believe that the experience of your Canadian peripatetic correspondent of April 24 is by any means representative. As in other fields the malcontents are the noisy ones who decry the system into which they cannot fit. The true pioneer who settles down to his new professional life does not broadcast the fact, and his very silence is an indication of his successful adaptation.

Tradition has accustomed hospital staffs to the ritual of the honoraries' ward round—the downcast eye, the muted voice, the cat-like tread, and meekly folded hands of the nursing staff. Though less obtrusive these days such customs still flourish, and nowhere to a greater extent than in the theatre, where the personal whim of the surgeon is the subject of intense interest. Once the fundamentals of surgical technique have been mastered it is the prime object of the theatre staff-nurse to read, mark, learn, and inwardly digest the fancies and idiosyncracies of the four or five surgeons with whom she has to deal.

Appendicectomy would appear to be, for the nurse at least, a simple and straightforward operation. A limited number of essential instruments and a consistent succession of ligatures seem all that is required. Ah, but the initiated will know that Mr. A will use only a Mayo's needleholder which Mr. B, who has become an expert with a Halsted holder, would decidedly reject. Mr. A likes Spencer Wells artery forceps, and abhors the Kocher pattern which is the favourite of Mr. B. Mr. B invariably uses a single chromic suture for the peritoneum, but woe betide the ignoramus who presents such a one to Mr. A. One appendicectomy is not complete without the application of pure carbolic to the stump, but if Mr. B should espy so much as the empty bottle of this (to him) accursed fluid his remarks would be more caustic than the offending fluid itself. The grand finale of Mr. A's operation is the application of Michel clips, but no-one would think of offering them to Mr. B, who likes nylon sutures, at the moment, anyway.

Magnify these details through a succession of the more extensive operations commonly performed in general surgery, with the addition of some that are not so commonly performed, and the likes of Mr. A and the dislikes of Mr. B will fill a book. Mr. B will look one defiantly in the eye and declare that for this particular purpose he *always* uses thread, though it is well known to all that yesterday he was using catgut. For 364 days in the year Mr. A will sew up with nylon, and on the 365th will be pleased to ask "For what is this miserable piece of string intended?" On Monday Mr. B will ask for a Poirier's forceps and on Tuesday for a Schipot's and on each occasion accept quite willingly an Allis's forceps which "was what he meant," of course. For many moons Dr. X, the anaesthetist, will contentedly and successfully use a certain intravenous needle, until one day the monstrous thing suddenly becomes quite useless. Banish the offending object for a month, and when it is silently and tactfully reintroduced it will probably be hailed with cries of joy as the perfect instrument. For the benefit of this anaesthetist and the smooth running of her theatre too, the nurse will, on his duty day, remember to provide two or three of the more scurrilous weekly periodicals. Yet another time she must produce

innumerable lengths of rubber tubing for the mysterious purposes of Dr. Y. These will next day be supplanted by that unique apparatus beloved by Dr. Z, which involves among other impedimenta, the use of a spare cork of a certain diameter and a derelict expiratory valve, accent on the "derelict."

The memory of the theatre nurse must be infinite if her passage through any operating-list is to be peaceful. She must recall that what Mr. C calls "Mr. Harris's drops," has for the rest of the world a more utilitarian and scientific, if less endearing, name. That a "thing-amijig" to Mr. D may be a sterile hairpin, but to Mr. E it is a small gauze swab. She must not forget that when she mops the dripping brow of Mr. A the towel must be wet, but for Mr. B it must be dry, or else. . . .

It would be seditious, of course, to suggest that it matters not one bit whether the catgut be chromic or plain, continuous or interrupted, or the clamp a Peyer or a Lane. Such an idea would occur only to the Philistine. If Mr. B is forced to scrub up with green soap when he has a definite preference for yellow, or to don a gown of a hue that is violently distasteful to him, or to use a tool that does not have the right feel, he may well, in his aggravation, anastomose the wrong end of his loop of bowel. If Mr. A cannot have his kangaroo tendon just so, he may remove the gall-bladder instead of the stomach. Yet each patient of each "firm" will, in an uncomplicated case, almost inevitably recover uneventfully and go home to tell an almost identical story and exhibit an almost identical scar.

It is quite true—American hospitals are just as we see them at the movies. Those I have seen so far are grandificent, splendiferous, and supercolossal. The interns and residents, male and female, are dressed entirely in white, even to their shoes. The students wear white jackets and the attending staff white coats. The graduate nurses are clad all in white also, and what distinguishes the dress of a nurse from that of a female resident is a little difficult for a mere male to explain—but the nurses of course wear white caps. All the other ranks of the hospital hierarchy wear coats of distinctive colours. With a coat one can go anywhere in the hospital unchallenged. Without a coat one is liable to be stopped at every turn by a guard or a clinic aide, either wanting to know one's identity or politely asking "Can I help you?"

There are loudspeakers all over the place which call for "Dr. Smith—Dr. John Smith—Dr. Smith." Only rarely is there a call for a being of lesser rank who is then usually anonymous: "X-ray technician—X-ray technician." This paging is done by the telephone operators, whose voices are all the same and always very professional. No doubt it would sound like something out of this world if the system could be used directly by the whole caboodle, from an impatient chief to a nurse agitated by some ward crisis.

And, to complete the familiar movie set-up, an intern rides the crash-wagon as it rushes through the streets, emitting a wailing sound like a minor air-raid siren.

In a recent higher examination in medicine I was asked to look at a chest X ray. "This is an X ray of the chest," I began in the approved time-spinning style. "It is underexposed and taken slightly askew. The bony. . . ." "You needn't reel out all that stuff," the examiner cut in, "what is it?" "A sacular aneurysm of the first part of the aortic arch," I replied. It was obvious; a policeman could have seen it. "Are you sure?" the examiner asked. "Absolutely!" I replied with conviction. "Syphilitic." I looked up from the viewing-box, for the examiner appeared to be breathing heavily. "How pale he looks," I thought to myself, "he must be over-examining."

I thought no more of this little incident until I read a recent contribution by your Peripatetic Correspondent (May 22, p. 808) and then I began to wonder. . . .

Needless to say, we have an appointment to meet again in the near future. But this time I will not be caught. If I am shown a chest X ray with the same sinister aortic swelling it will influence me little in what I say, for I shall be gazing into my examiner's eyes. My answer will depend on what I see there.

## Letters to the Editor

### WAR-TIME AUXILIARY HOSPITALS AND HOMES

SIR,—At the request of the Army Council, and subsequently of the War Office and the Ministry of Health, the Joint War Organisation of the British Red Cross Society and the Order of St. John opened during the war years some 250 establishments in England and Wales. These comprised convalescent hospitals, auxiliary hospitals, convalescent homes, and residential nurseries. Many establishments providing simple convalescent amenities became hospitals organised for curative and rehabilitative treatments. Well over half a million patients passed through these hospitals and homes. They included officers and men of the British, Dominions, Indian, and Allied Forces, and members of the Women's Auxiliary Services; civilians injured by air attack; infants up to 5 years of age and children from that age to 14, all in some way victims of the war.

Of the value of these establishments, Lieut.-General Sir Alexander Hood, director-general of Army Medical Services, wrote: "No praise can be too high for the services rendered to the Army by the Hospitals and Medical Services Department of the War Organisation which has provided care and comfort for thousands of officers and men and done so much for their restoration to normal health and strength." Two Ministers of Health also expressed appreciation. Mr. Willink, describing their assistance as invaluable, said: "But for the willing help given at all times by the auxiliary hospitals the work of the Emergency Hospital Scheme could not have proceeded so smoothly." Mr. Aneurin Bevan described them as "a great boon not only to the soldiers but also to men and women of other Services, and to a certain extent to civilians. No trouble," he added, "has ever been too great for workers in this field to take to secure the comfort and well-being of the patients, and I know that a great deal of very willing voluntary service was rendered."

A number of these convalescent homes were continued after the end of the war, at the urgent request of His Majesty's Government, under the administration of the Joint Committee, St. John and Red Cross. The last remaining home will close its doors on July 4, and we are most anxious to take this opportunity of expressing in your columns our deep gratitude to all those who made possible this remarkable contribution to the healing and restorative services of the war. To Lord Horder and Sir Alfred Webb-Johnson, joint chairmen of the medical department of the War Organisation, which administered the homes, and to the individual doctors and surgeons who gave so much devoted and gratuitous service, we desire to express, on behalf of the Society and the Order, our profound and sincere thanks.

CHETWODE

Chairman of the executive committee,  
War Organisation, Red Cross and St. John.

WOOLTON.

Chairman of the joint committee,  
St. John and Red Cross.

### REMUNERATION OF MEDICAL TEACHERS

SIR,—I am glad to see that in your leader on the third Spens report you have again emphasised the anomalous position of medical teachers. In your issue of March 6 (p. 374) you put very well the difficulties and possible solutions. Then the pay of the medical teacher was being compared with that of the general practitioner. The proposed rates for the remuneration of specialists and specialists in training make the difference even more startling.

Most universities have now appointed full-time professors in medicine, surgery, child health, and other clinical subjects at remunerations of £2000-£2500 yearly plus superannuation. Their qualifications are well known and might reasonably be expected to entitle them to one of the superscales so that their pay should be not less than £3000-£5000 at 1939 rates. These professors, and also part-time professors and directors of special departments, have usually whole-time deputies known as "lecturers" in medicine, surgery, and so on. Their place is less well known: they are for the most part

men with higher qualifications, well beyond the registrar stage in experience, often with a background of several years' individual research, and not a few served as officers in charge of medical or surgical divisions in the Services during the war. They are in fact of the standing of "assistant" physicians and surgeons in teaching hospitals and can therefore consider themselves entitled to a remuneration of £1500-£2500 yearly at 1939 rates, and some might justifiably qualify for superscale payments on the grounds of original work and special usefulness. Yet their present salaries, at 1948 rates, are £800-£1000 yearly—an advertisement for such a post at these rates appeared in your advertisement columns as lately as June 5. After July 5 these men will have under them specialists in training who may be drawing up to £1200 at 1939 rates, and the superannuation protection will apply equally to teachers and taught. Furthermore the specialists and specialists in training are to be given allowances for attending society meetings (national and international), for journals, society subscriptions, new books, travelling, and other things: all these are even more important for the medical teacher employed by a university, but he has so far asked for them in vain.

Such a state of affairs is clearly intolerable and unless remedied would lead to the rapid disappearance of university clinical staffs. Your annotation of March 6 pointed out a likely solution—that these men should be paid for their hospital services and their total remuneration thus be brought up to the level of other non-teaching physicians and surgeons. This solution is easily understandable when applied to those who "assume responsibility in matters of life and death." But what about those medical teachers who do not assume these responsibilities—the anatomists and physiologists, the academic bacteriologists, the pharmacologists who are disguised physiologists and have no practical experience of therapeutics? Their salary range is from £500 yearly for lecturers to £1500 for professors. At these rates it will only be possible to attract to these departments medical men who have such a positive dislike for handling disease that they are willing to accept serious sacrifices.

The universities may well be dismayed at the prospect of finding many thousands of pounds a year to provide comparable salaries for these non-clinical departments, and they may be forced to accept the solution of being satisfied with staff who are not medically qualified.

In the meantime it is essential that the clinical teachers at least should know where they stand—even if exact rates are not settled—by July 5, and I am certain that they can rely on your valuable assistance in attaining this first step.

MEDICAL TEACHER.

### INCOMES FOR SPECIALISTS AND GOVERNMENT MEDICAL OFFICERS

SIR,—The *Times* very rightly remarked in their leader of June 5 that the recommendations of the Spens Committee are satisfactory to the medical consultant as regards the amount of money offered. The report will be less happily received because of the enormous gap still existing between the salaries of the general practitioner and the specialist.

This seems to apply even more to whole-time medical officers in the Government services. In the general-duty grade the top of the salary scale is reached at 47, and is £1400—i.e., £100 less than the budding specialist gets at 32. At 40, when every specialist should get a minimum of £2500, the Government medical officer is offered £1150 and not even in 1939 money value. A principal medical officer and a director of medical services have £1400-£1600 and £1600-£1800 in some departments—a little more at the Ministry of Health. Extra remuneration for domiciliary visits, and expenses, are granted to specialists only and also extended paid leave for study and research.

This means obviously that the layman is right when he thinks that the medical officers in the Government service must be the misfits of the profession. One of the lay administrators (who are paid more than their medical colleagues of similar status and responsibility) remarked the other day: "For the work you are doing you receive a sufficient salary. Surely, if you were more capable in

your profession you would not have entered a Government service." There is a strong undercurrent of resentment among the medical officers in the Government services because of this. We are expected to do specialised work and possess higher degrees, if possible, and never to complain.

I, for one, feel the acute hopelessness of our position. Once, I felt proud to belong to the service; today the only wish I have is to get out of it even at the risk of sacrificing acquired rights of pension. I know that there are many of my colleagues who feel the same. Our younger colleagues in the profession have already seen the danger signal; in the recent recruitment drives for the service the younger generation kept noticeably and wisely absent.

As a Civil Servant I have to sign myself—

A STEPCCHILD OF THE PROFESSION.

### REPRESENTATION OF SPECIALISTS

SIR,—I suggest that Dr. Bourne in his letter last week confused two quite separate functions of professional organisation. The duty of an undergraduate teaching centre is to establish a very high standard of hospital work in all its aspects—a standard which can be emulated. Senior members of its staff can, as individuals with experience of specialist practice, play a useful part in the health service outside their medical schools as members of advisory committees and the like. But the teaching hospitals, and equally the Royal Colleges, are primarily academic and scientific bodies; they cannot, without damage to their integrity, assume the organisation of specialists in what is essentially a trade-union capacity.

The British Medical Association has a long experience of such work; but I agree with Dr. Bourne in doubting whether it is the appropriate body to organise specialist representation in the National Health Service. There is no essential incompatibility between the interests of general practitioners and specialists, but these interests differ widely. The B.M.A. is regarded by many if not most specialists as a general-practitioner organisation, and its policies of recent years in relation to health service have by no means commanded universal respect.

I suggest that the only satisfactory way for specialists to secure representation is through spontaneous regional associations linked to a central autonomous council. It is an obvious necessity that the medical schools should be represented on regional councils, and desirable that the colleges should be represented on the central council, at least in an advisory capacity. The British Medical Association might well be represented also, both regionally and centrally. There is no difficulty in the formation of regional associations, and a willing acceptance by specialists of the need. There are innumerable subjects, besides those of remuneration and conditions of service, which require regional as well as national negotiation, and the regional associations, as autonomous bodies, should be of great value to regional hospital boards.

There is immediate need, however, for a representative body to negotiate with the Minister the implementation of the Spens report, and for this limited purpose I suggest that the Government and the profession could both accept a committee appointed jointly by the Royal Colleges, the Scottish Corporations, and the B.M.A.

DUNCAN LEYS

Chairman, South-East Metropolitan  
Regional Specialists' Association.

Bickley, Kent.

### THE COLLEGE OF SURGEONS AND THE SUPPRESSION OF FELLOWS' OPINION

SIR,—In an annotation headed *Surgeons in Camera* in the *British Medical Journal* of May 8, the meeting of the fellows of the Royal College of Surgeons of England held on April 28, 1948, was briefly mentioned. That meeting was summoned by a requisition of March 11, signed by 33 fellows, in order to discuss the position of the National Health Service Act in relation to the British Medical Association plebiscite held early this year. The importance of that meeting lay in the fact that it was the first meeting of fellows (who are the electors of the council) held since the Act became law, at which resolutions

dealing with the Act had been permitted. It is regrettable that the three resolutions which were passed at the recent meeting criticising the Act should have been withheld from the profession and from the public.

A meeting of fellows on Nov. 29, 1946, was held without the three weeks' notice required by the regulations, and this prevented resolutions from being put forward. Subsequently, when resolutions were put forward at the meeting, they were ruled out of order because notice had not been given; but the medical press were present, and the meeting was reported in your columns. The recent meeting was advertised in the medical journals and attended by fellows from all over the country. On arrival the fellows found the agenda paper had been marked "confidential." No preparations had been made for scrutiny of voting, and no preparations had been made for a ballot. After some two hours, when a ballot was called for on the second motion, the meeting was declared secret. It subsequently appeared that the medical press had been excluded from the meeting, and no report of the meeting and the resolutions has as yet appeared in the medical or lay press.

During the past few years the president of the Royal College of Surgeons has used his position and prestige to make pronouncements about the policy of the college as a corporate body—pronouncements that have profoundly influenced both public opinion and the course of events. Those pronouncements would have been more acceptable to the medical profession had there been any evidence that they also represented the views of the fellows. The recent resolutions were the considered views of the fellows, and as such should have been accorded the publicity which presidential announcements have received in the past.

The ancient structure of the Royal College of Surgeons may be adequate for dealing with routine college business but it is not adequate for politics. If the college is to take part in medical politics it is essential that in the future the fellows should have a ready and speedy method of making their views known. The fellows of the largest medical college in the country are a responsible body of men, and their views should be of value, both to the medical community and to the community at large. The recent resolutions of the Royal College of Physicians of London and the Royal College of Physicians of Edinburgh were published in both the medical and other journals, whereas the resolutions passed at the recent meeting of fellows of the Royal College of Surgeons have not been made known either to the medical profession or to the public. The fact that such a suppression of opinion can occur is a serious criticism of the constitution of the Royal College of Surgeons.

A. ROY DINGLEY	REGINALD L. MURLEY
CHARLES HAMBLEN-THOMAS	REGINALD T. PAYNE
JOHN HOSFORD	ALEX. E. ROCHE
NORMAN A. JORY	W. ETHERINGTON WILSON.

### ELLIPTOCYTOSIS

SIR,—Your annotation last week interested me because within the last six months I have encountered 7 individuals with elliptocytosis. Of these, 4, none of whom was known to be related to any of the others, were blood donors; and 3 further instances of elliptocytosis have so far been detected amongst their relatives. All 7 are apparently healthy; full hæmatological examination of blood from 5 of these has been carried out, and none has shown any evidence of abnormal hæmolysis. Of the donors, 1 belonged to group O, and I had the opportunity of transfusing his blood to a group-A recipient who had bled from a peptic ulcer six weeks previously. Although this donor's blood contained erythrocytes of which 90% were elliptical, they survived for 100–110 days in the recipient's circulation. The survival-time was estimated by the differential agglutination technique of Ashby<sup>1</sup> as modified by Dacie and Mollison,<sup>2</sup> using a powerful anti-A serum prepared in rabbits by Dr. W. T. J. Morgan at the Lister Institute.

It is of interest that in an addendum to the recent description by Singer and Robin<sup>3</sup> of a rapid test for the detection of the sickling phenomenon, they report their

1. Ashby, W. *J. exp. Med.* 1919, 29, 267.

2. Dacie, J. V., Mollison, P. M. *Lancet*, 1943, 1, 550.

3. Singer, K., Robin, S. *J. Amer. med. Ass.* 1948, 136, 1021.

observation that "in three instances [of transfusion of sickle-cell trait erythrocytes into patients with sickle-cell anaemia] the 'trait' cells survived normally, that is, about 100-120 days." These findings suggest that neither elliptocytes nor sickle "trait" cells are especially liable to premature destruction within the circulation, and that hæmolytic anaemia in patients showing either elliptocytosis or drepanocytosis cannot properly be attributed to the peculiarities of their respective erythrocytes.

If elliptocytosis is to be recognised more often in the future, it should be realised that elliptocytes are much more obvious in wet than in dry preparations; even if their peculiar shape is noted in a stained film, they may be dismissed as artefacts; and I think it should be stressed that the only worth-while place to look for them is in the red-cell counting-chamber.

R. H. TRINICK  
Deputy Director,  
South London Blood Supply Depot,  
Ministry of Health.

Sutton, Surrey.

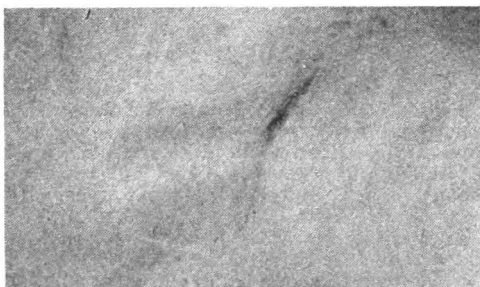
#### BODILY CHANGES DURING ABREACTION

SIR,—As a postscript to my report<sup>1</sup> on the spontaneous appearance of rope marks on the forearms of a patient during the abreaction of an incident that had happened ten years before, I wish to record another case with similar features.

The patient, who consulted me privately because of persistent insomnia, was a married woman in the late thirties. She had had an extremely unhappy childhood, in which a sadistic father had played a prominent part. At 17 she was treated at home for a "nervous breakdown," and after recovery she seems to have had a widespread amnesia for the unhappy events of her earlier life. During treatment by me she dissociated very readily and relived these events in dramatic style. If they had involved physical injury, a somatic repetition of what presumably had been the original injury almost always appeared. Swelling, bruising, and bleeding were observed by me on at least thirty occasions. The following are examples:

(1) The morning after abreacting an incident in which she had been thrashed with a cutting whip at the age of 8 years three large bruises of appropriate shape appeared on her left buttock.

(2) After the abreaction of another thrashing episode, in which one stroke appeared to catch her accidentally over the shoulder as she flinched, a red mark 2 in. long appeared over the left clavicle within 20 minutes. I applied an elastic plaster dressing, taking careful note of its exact position. When I removed it the next morning, the dressing was bloodstained and the skin over the lesion was oedematous and flaky (see figure).



(3) A small scar, the result of an accident in childhood, was watched carefully during the abreaction of the accident. First there was flushing of the skin adjoining the scar; then petechial hæmorrhage appeared; and finally slight flaking of the epidermis could be seen—all within about half an hour.

(4) The abreaction of another accident, in which she had sustained a fracture of the right wrist, was followed by swelling and hyperæmia; 2½ hours after the abreaction the circumference of the wrist had increased by ¼ in.

(5) A few minutes after abreacting an incident in which she had cut herself by rushing through a window long red

streaks appeared down each leg. The patient reported that these bled during the night.

(6) Particularly interesting was the abreaction of an occasion on which her father had struck her on the arm with a stick. The usual hyperæmia was evident immediately afterwards, and the next morning a bruise had appeared. On closer examination I noticed a curious sharply defined pattern on the oedematous skin over the bruise. The patient could not explain this until she dissociated again, and then she said that her father had used an elaborately carved stick, which she described to me in detail.

Finally, as a "test case," I produced an abreaction in the presence of my colleague, Dr. T. A. Munro. We found no abnormality of the hands before the experiment. The abreacted incident was one in which the patient had been struck across the dorsum of the hands with a cutting whip. A few minutes after the abreaction transverse red streaks became visible. The right hand was then covered with lint and encased in a firm plaster bandage. The plaster, which had remained completely intact, was removed the next morning in the presence of both of us. There were obvious bloodstains on the dressing immediately covering the weals. Dr. David Erskine, registrar to the skin department, Guy's Hospital, reported on the weals as follows: "There is an oedematoid reaction of the skin, with small eruptions of the cuticle." The lesion was photographed but unfortunately did not show up so well as the one reproduced here.

I refrained for therapeutic reasons from attempting to produce "new" lesions by direct hypnotic suggestion. I do not know whether this would have been possible. The phenomena I observed were all, so far as circumstantial evidence goes to show, somatic repetitions of previous experiences.

London, W.1.

ROBERT L. MOODY.

#### CARS FOR DOCTORS

SIR,—From time to time there have been comments on the supply of new cars for doctors. The motor industry and trade have constantly had this question under review, and we wish to record the following points:

1. At no time has the industry undertaken to give absolute priority to doctors. The term used is "preferential delivery," which is intended to apply only where a doctor has no serviceable car or no car at all.

2. Delay in delivery to the ordinary public has been anything up to 3-4 years and may now be considerably more; and a doctor is getting preferential delivery if he obtains a car in, say, one year less time than the ordinary public. A doctor may thus still have to wait a very considerable time, and he is not expected to refrain from placing an order until his car is on its last legs.

3. The efforts of the trade to meet doctors' requirements have been frustrated to some extent by a minority of doctors who have abused the privilege. The trade holds considerable evidence of this abuse.

It will be recalled that the export percentage for motor cars has been consistently increased over the last two years, and this has added to the difficulty of forward planning of deliveries. In fact, less than a quarter of the number of new cars that were available each year before the war are now allocated to the home market, despite the enormous pent-up demand. The position is complicated through doctors placing their orders by make. Of recent months some manufacturers have been exporting practically their whole output, and orders placed for these makes, therefore, have been, and will be still further, delayed.

A recent survey shows that distributors and retailers have been giving preferential delivery to doctors. No less than 47% of doctors' orders have been fulfilled in the last two years, whereas in the same period only 18% of orders placed by all other users have been fulfilled. Other users include Government departments, police, nationalised corporations, and owners of large industrial fleets.

R. GRESHAM COOKE  
Director, Society of Motor Manufacturers and  
Traders Ltd.

A. W. GRAFTON  
Secretary, Motor Agents Association Ltd.

1. Moody, R. L., *Lancet*, 1946, ii, 934.

## THE SITUATION

SIR.—It might be useful to inquire as to the actual position of the profession today as the result of the recent action taken by the representative body of the British Medical Association.

We had two alternatives before us early this year—and this whether we consider the progress of medicine, the best service for the public, or our own freedoms—either to get the present Act so amended that these things would be safe for a considerable period or to give the Minister a blank cheque and be in perpetual doubt as to whether we could honour it, in other words, watch every regulation with critical eyes for an indefinite time.

In February we had no doubt that the first alternative was the proper one, and we said so. In April the hurried plebiscite, with its implication that the position had changed materially, and the volte-face of the council, which the chairman was powerless to oppose, broke the all too tenuous thread which held us united, and in May, through the representative body, we chose the second alternative.

How, now, are we to clarify the position and regain our self-respect and the respect of the public? There is a large section of the profession which feels that these things should not be left in the hands of men who, despite all their arduous deliberations, did "take the wrong turning." Confidence in them has been badly shaken. There are many doctors asking for guidance, both for themselves and for their sons and daughters, thinking of medicine as a vocation. To these are to be added many members of the public. There will shortly be a third group—men who will leave the service they have too hastily joined out of fear and not conviction.

What is the best way of dealing with the situation? Will you allow me, Sir, to say through the medium of your columns that I shall welcome the views of any of your readers sent to me privately. Such a step as this seems to me desirable before any action is taken in which I am concerned.

32, Devonshire Place, W.1.

HORDER.

## SALICYLIC ACID FOR CORONARY THROMBOSIS?

SIR.—It appears that two processes are involved in the pathology of coronary thrombosis—atheromatous arterial degeneration and blood coagulation. We seem unable to control the former, but recently we have learnt something about the control of the latter. Much remains obscure about coagulation, but it is reasonable to suppose that the coagulability of the blood is controlled by the liver, the factory of prothrombin and presumably, too, of heparin.

Clinical experience suggests that coagulability varies in degree from time to time; for the occurrence of thrombotic states, characterised by multiple thromboses, is fully recognised. In 1933 Strickland Goodall<sup>1</sup> suggested that such a blood change may be a primary cause of coronary thrombosis. This seems reasonable; for though it is easy to imagine the gradual occlusion of a diseased artery by the accretion of platelets, it is difficult to understand the sudden development of local fibrinous thromboses except as the result of increased coagulability of the blood as a whole. In the treatment of coronary thrombosis dicoumarol is steadily gaining favour, but its dangers are not yet fully understood or controllable. It is thought to act by preventing the conversion of vitamin K into prothrombin by the liver. It seems that salicylic acid has a similar action,<sup>2</sup> and it is known that these two products are structurally related. It has even been suggested that dicoumarol effects its specific action by being degraded to salicylic acid in the liver. However that may be, clinicians know that salicylates given in full dosage sometimes induce an obvious hæmorrhagic state. With these facts in mind, I would suggest that at least until we know more about dicoumarol we might use salicylic acid for the treatment of coronary thrombosis: it could do no harm and might well do good. We might even go further than this; for if Goodall was right in supposing that a thrombotic state precedes the occurrence of coronary thrombosis, and if in fact the liver

does control the coagulability of the blood, it follows that in the prevention and treatment of this condition we should direct our attention to the liver. It may be of more than passing interest that salicylates not only induce hypoprothrombinæmia but are also reputed to have a cholagogue action.

It is probable that this idea of substituting salicylic acid for dicoumarol in the treatment of coronary thrombosis has occurred to others; and so I venture to cast my bread upon your waters in the hope that I may see it again after many days.

Torquay.

PAUL GIBSON.

## TOXIC EFFECTS OF MYANESIN

SIR.—The principal toxic effect of 'Myanesin' is described as hæmolysis with hæmoglobinuria. Pugh and Enderby<sup>1</sup> point out that the high threshold value for the excretion of hæmoglobin by the kidney prevents its appearance in the urine unless considerable lysis has taken place.

I have been investigating the effect of myanesin on hysterical motor paralysis, to see if the alleged muscle-relaxing power of that drug<sup>2</sup> would facilitate return of movement at the fixed joints.

The patient selected was a man, aged 35, with motor hysteria. He had a pseudo-poker-back from spasm of the nuchal and paravertebral muscles. There was no evidence of organic disease. Pulse-rate 68 per min., regular. At the start of the trial the urine was found to contain neither albumin nor blood; thereafter every specimen was tested.

May 1.—6 ml. of 10% solution of myanesin, injected intravenously, produced no effect on the patient's voluntarily abducted arm. A slight improvement was noted in rotation of the cervical spine, but not appreciably more than had been observed previously with thiopentone-induced hypnosis. Five min. later 8 ml. of the same solution produced a similar effect.

May 3.—10 ml. of the solution produced no relaxation of the patient's abducted arm. There was freer and a more extensive range of head-turning movement, but no change in the spastic antagonistic muscle-groups whose simultaneous contractions soon brought any rotation of the cervical spine to an abrupt halt.

May 4.—At 11 A.M. 17 ml. of same solution gave an effect no different from that of the previous day. At 12.30 P.M. the patient passed wine-red urine. Tests for blood pigment were strongly positive; microscopical examination of a centrifuged specimen showed only one or two red blood-cells per field. No spectroscope was available, but one could assume that hæmolysis had taken place, with overflow of some blood pigment into the urine. Red blood-cells 4,496,000 per c.mm.; Hb 80%; colour-index 0.9. General condition satisfactory. Pulse-rate 52 per min., irregular, showing 3:1 alternating with 4:1 partial heart-block. Copious fluids and large doses of alkalis were administered.

At 1.15 P.M. the urine was still wine-red and was neutral to litmus. Pulse-rate 52 per min., regular. At 2.15 P.M. the urine was straw-coloured and alkaline, containing no red cells or blood pigment. Pulse-rate 56 per min., regular. At 4 P.M. the urine was as at 2.15 P.M. Pulse-rate 58 per min., regular. Red blood-cells 4,432,000 per c.mm.; Hb 81%; colour-index 0.9.

May 5.—General condition satisfactory. Urine as at 4 P.M. on the previous day. Pulse-rate 68 per min., regular.

Though the results of this trial do not shed any further light on the problems of hysteria, nor on the site of action of myanesin, they do include two items which are, I believe, of interest. (1) It seemed that, as Pugh and Enderby suggest, the amount of blood lysed, and therefore hæmoglobinuria, is directly proportional to the dose of myanesin injected. (2) I had not previously come across partial heart-block shortly after the intravenous administration of myanesin. Hunter and Waterfall<sup>3</sup> state that myanesin has produced bradycardia, but make no mention of alteration in cardiac rhythm. I do not know whether a degree of hæmolysis *per se*

1. Pugh, J. I., Enderby, G. E. H. *Lancet*, 1947, ii, 387.

2. Berger, F. M., Bradley, W. *Ibid.*, 1947, i, 97. Leading article, *Ibid.*, March 27, p. 487.

3. Hunter, A. R., Waterfall, J. M. *Ibid.*, March 6, p. 366.

1. Goodall, J. S. *Brit. med. J.* 1933, ii, 392.

2. Fawns, H. T. *London Hosp. Gaz.* 1948, 51, 37.

may adversely affect the myocardium. The fall in the red-cell count between 12.30 p.m. and 4 p.m. on May 4 was not so great as to indicate ischaemia of the myocardium at the relevant time. It does therefore seem possible that myanesin itself exerted in this case a toxic effect either on the heart directly or through the cardiac autonomic nerves.

I have to thank Dr. J. S. McGregor, medical superintendent, for permission to make these observations and publish them. I am also particularly grateful to our laboratory technician, Mr. D. C. Hubbard, for the pathological investigations.

Notts County Mental Hospital,  
Radcliffe-on-Trent.

J. COWEN.

### MERCURY OR AESCULAPIUS?

SIR,—In your issue of May 1 (p. 689), a peripatetic correspondent asks why the U.S. Public Health Service uses in its corps device the winged caduceus of Mercury whereas the proper caduceus of medicine is that of Aesculapius.

The present corps device of the U.S. Public Health Service has been in use since 1871. The original function of the service, then the Marine Hospital Service, established by an Act of Congress approved by President John Adams on July 16, 1798, was to provide medical care for merchant seamen of the United States. The fouled anchor connotes a seaman in distress. The

caduceus of Mercury refers to commerce—that is, commerce in which the merchant marine of the United States participates. The corps device, therefore, has no reference to any medical symbol.



R. C. WILLIAMS  
Assistant Surgeon-General;  
Chief, Bureau of Medical Services.

Washington, D.C.

### ATTACK ON RHEUMATISM

SIR,—I am not surprised that no-one has ventured to inform me about the meaning of "rheumatism." What does surprise me is that anyone aware of its ambiguity should tolerate the name "rheumatology."

"Rheumatism" is applied to a number of different disorders. Readers of Dr. Mervyn Gordon's article in your issue of May 8 may have noticed that he says what he means by "rheumatism" in the first sentence: he means Bouillaud's disease, the rheumatic fever or acute rheumatism of our textbooks. If it means this and only this, there is no confusion. But rheumatic fever is rarely seen and still more rarely treated in clinics for the rheumatic diseases. Readers of a pamphlet issued by the Empire Rheumatism Council will find a list of disorders which, if words mean what they say, are to be regarded as specialised forms of one and the same disease—"rheumatic disease." But no-one seriously believes this—that rheumatic fever, osteo-arthritis, fibrositis, neuritis, sciatica, lumbago, and bursitis are clinical varieties of the same disease. A not uncommon type of note from a patient's doctor is: "This man has had recurrent iritis for the last two years; do you think it is rheumatic in nature?" I do not think he means rheumatic fever; but I do not know what he means. A common remark from patients is: "I am so glad it is only rheumatism, doctor; I was afraid it might be arthritis." I think I do know what they mean, and again it is not rheumatic fever.

Whenever the same name is applied to a number of different things, that name becomes unendurable in scientific work; for no general assertions can be made about it. "Rheumatism" is one of these woolly names. In medical nomenclature it is a muddle-headed, unmitigated nuisance. Unless defined on each occasion of its use, as Dr. Mervyn Gordon was careful to do, assertions about its causes, its prevention, and its cure are nonsensical. I do not expect to convert those already committed to the preservation of the word. My object is to show the younger generation, beginning the study of the "chronic rheumatic diseases," that if they will

state the problems in words that have a meaning they will see them as problems in medical orthopaedics. Only with a knowledge of the physiology and pathology of bone, joints, skeletal muscle, and peripheral blood-vessels can they hope to be successful. Orthopaedic medicine does not impose an artificial and wholly noxious restriction to the "rheumatic diseases." The title of "orthopaedic physician" has more dignity than that of "rheumatologist," and the wider experience which it implies will prove more satisfying intellectually.

If orthopaedic surgeons wish to contribute to the attack on rheumatism they have it in their power to make the biggest contribution of all. The formation of departments of orthopaedic medicine within existing orthopaedic units would at long last place the study of the chronic rheumatic diseases on a sound basis.

London, W.1.

KENNETH STONE.

### PYLORIC SPASM SIMULATING CONGENITAL HYPERTROPHIC STENOSIS

SIR,—We were interested to read of Dr. Falle's case (May 22), since we have had a similar experience, which gave us much difficulty in management.

A firstborn boy, 11 days old, was admitted to Booth Hall Hospital on March 6 this year, with a 4-day history of projectile vomiting after nearly every feed. Birth weight was 7 lb.; labour normal, full-term birth, and meconium passed normally. A single projectile vomit occurred when he was 2 days old while being breast-fed. When complementary feeding was begun 7 days after birth, nearly every feed was vomited. One green stool was passed on the day of admission.

*Examination.*—Weight 6 lb. 10 oz.; general condition satisfactory; dehydration slight; feed taken readily; visible peristalsis present and well-marked tumour palpable. The feed ended with a projectile vomit. No stool was passed for 24 hours before operation.

*Laparotomy* on March 7: nil abnormal found.

*Progress.*—Cow's-milk feeds were given, suitably diluted for age and weight, thickened with 'Benger's Food.' Extra fluid was given when required as 5% glucose in 1/5 normal saline. Atropine methyl nitrate gr. 1/750 ('Pylostropin') was given immediately before each of three feeds daily. For 4 days after operation the infant had 5-7 projectile vomits and 2-4 stools daily. Vomiting was temporarily relieved by a gastric drip, the atropine dosage being maintained; but it began again after 4 days, and the tube was withdrawn. At this stage a barium meal showed no delay in gastric emptying.

After 2 weeks of atropine therapy a faint mottled rash appeared on the trunk but without other evidence of atropine overdosage. Pylostropin was discontinued, and phenobarbitone gr. 1/8 8-hourly was given by mouth. Projectile vomiting increased in frequency, necessitating daily parenteral fluids subcutaneously for a week. Visible peristalsis still remained, but there was no abnormality on palpation of the abdomen. There was no gastric residue. Weight was now 5 lb. 6 oz. It was then decided to try the atropine and phenobarbitone in combination. Atropine was given immediately before four feeds daily, and phenobarbitone gr. 1/8 6-hourly. Definite improvement was manifest in 3 days, and the projectile vomits decreased to 1-2 daily; weight began to increase slowly. Further vomits ceased to be projectile. There were 2 normal stools daily.

After 3 weeks' combined treatment an attempt was made gradually to withdraw phenobarbitone, but projectile vomiting began again up to 5 times in 24 hours. The vomiting was eventually completely controlled by 2 daily doses of phenobarbitone and 4 of atropine. At this stage suppurative otitis media followed by sensitisation dermatitis complicated progress.

Since vomiting was now controlled, another attempt was made to reduce drug dosage. Phenobarbitone was successfully cut down to gr. 1/8 and pylostropin to gr. 1/750 per day. Vomiting had ceased completely, and on May 29 the infant was discharged, weighing 7 1/2 lb., to a good home, where this progress has been maintained.

There are various points of interest in this case. (1) It presented as one of typical pyloric stenosis. (2) The infant's good condition on admission would seem to have merited a trial of medical treatment.

The course after negative laparotomy suggests that operation would almost certainly have been advised eventually, when the baby's condition was much less satisfactory. (3) Independent, and at first inadequate, dosage of atropine methyl nitrate and phenobarbitone was ineffective in reducing the vomiting. Response to combination of both drugs suggests a possible synergism. Even so the response to this treatment was slow and necessitated prolonged stay in hospital, with its usual danger for infants. Compared with "the immediate and dramatic effect" of glyceryl trinitrate there is no doubt about choice of treatment, though we note that Dr. Falle's case was retained in hospital a further 58 days after trinitrate treatment was initiated.

It has been suggested that cases of classical pyloric stenosis which come to operation and in which nothing is found, should nevertheless have a Rammstedt operation performed. This relief of spasm might render unnecessary prolonged medical treatment and its associated risks.

Booth Hall Hospital,  
Manchester.

N. M. MANN  
A. R. ANSCOMBE.

### ARTIFICIAL LIMB MONOPOLY

SIR,—Early this year the Ministry of Health approached the Surgical Instrument Manufacturers' Association and advised them that under the National Health Service Act their department would be responsible for the supply of all surgical appliances, artificial limbs, &c., which would be required in connexion with the Act. They requested that the S.I.M.A. should appoint a committee representative of the various sides of the industry to meet the Ministry of Health in order to discuss details for the efficient supply of their requirements.

As chairman of the artificial limb makers' committee of the S.I.M.A. I attended the meetings with the Ministry of Health and subsequently with the Ministry of Pensions. At our first meeting held on Feb. 17 we were informed by the Ministry of Health that they had no organisation whatsoever prepared and that they had no technicians with a knowledge of surgical appliances. They assured us that it was the Minister's intention that the supply of all types of appliances and artificial limbs should continue under the Act on very largely the same basis as in the past until a proper organisation could be worked out. In fact, they were not prepared for the obligations placed upon them by the Act and asked for the co-operation of our industry in making the Act work. Our association gave the Ministry of Health an assurance that we were willing to help them to the greatest possible extent in making things work smoothly and details were discussed and arranged on the method of ordering, supply, and certification. At a meeting on March 24, we were suddenly advised that interdepartmental consultations had taken place since the last meeting and that the Ministry of Health had decided to appoint the Ministry of Pensions as its agent for the buying of all surgical appliances and artificial limbs required under the Act. At that meeting the Ministry of Pensions when questioned refused to state its policy with regard to the supply of artificial limbs.

At a further meeting held at the request of the Ministry of Pensions on April 28, we were informed that this Ministry had decided to create a monopoly in so far as the supply of artificial limbs was concerned. I quote from the minutes of this meeting:

Mr. HOOD (Ministry of Pensions) stated: "It had been decided that all supplies of artificial limbs required for the National Health Service would be obtained from the Ministry's existing contractors."

Mr. DREW (chairman, S.I.M.A.) pointed out that this decision would mean that all private makers would be dead under the Act, but Mr. Hood thought that they would be able to carry on some part of their trade by dealing with private patients.

Mr. DESOUTTER said that the Minister of Health had stated that the surgeon would be free under the Act to prescribe the type of appliance he considered best for the patient. If a surgeon prescribed a Desoutter limb and the patient could not have it, then what became of the Minister's statement?

Mr. HOOD (M. of P.) said that any cases in which the surgeon recommended the supply of an artificial limb would go to the Ministry of Pensions, whose limb surgeons would prescribe the actual type of limb required. It was the intention that amputation cases should go to Ministry hospitals—at the pre-amputation stage where possible—for limb fitting on the same lines as had obtained during the war in respect of Service casualties.

Mr. MASTERS asked whether it was proposed to compensate limb makers who were being put out of business and in particular what action would be taken in respect of stocks of component parts held by them which would no longer be of use.

Mr. HOOD (M. of P.) said that the question of compensation did not arise as the limb makers would still be in a position to accept private trade.

Mr. DESOUTTER registered a strong protest against being brought to this meeting in order to be told of a decision already taken.

In practice, the Ministry of Pensions' decision to create a monopoly will mean that in future people who suffer amputation will not be able to take the advice of the surgeon who does the amputation. They will in all cases be referred to Ministry of Pensions hospitals, where possible at pre-amputation stage, and the Ministry of Pensions' surgeon will only be able to prescribe one model of limb made by a sole contractor. It is clear that there will be no choice on the part of the patient or by the surgeon advising him.

Such a monopoly is bound to lead to complete autocracy in the supply of artificial limbs in the future; in a few years there will be no comparison available in this country for the quality of product being supplied, the cost of the product, or the service being given to amputees. Monopoly will also lead to stagnation in design. There are 27 private firms manufacturing and fitting artificial limbs who are members of our association, and the majority of these will face extinction.

Surgical Instrument Manufacturers'  
Association, 6, Holborn Viaduct,  
London, E.C.1.

E. R. DESOUTTER.

### HOSPITALITY FOR GERMAN DOCTORS

SIR,—Your correspondent, Dr. Maguire, asks (May 22) why invitations for medical courses in this country are confined to "German doctors" and are not extended to "doctors in Germany." The Medical Supplies Committee for Germany and Austria has been asked to arrange hospitality for a number of German doctors, for whom courses are being arranged by the Foreign Office (German section). Doctors among the displaced persons are cared for by the International Refugee Organisation under UNO, and not by the Foreign Office. This explains why the Foreign Office scheme is limited to German doctors.

SOMERVILLE HASTINGS

Chairman of the Medical Supplies  
Committee for Germany and Austria.

House of Commons.

### SELECTION FOR THE CIVIL SERVICE

SIR,—In your annotation last week you put forward the view that "those who spring to the defence of the new technique [of selection] in the service will be poorly armed until validation is achieved." You should have added that the defenders of the old technique are equally poorly armed, since there is no evidence of the validity of the type of examination previously employed for selecting civil servants. No scientifically controlled validation of these examinations was ever attempted, and no evidence can be produced that those who did well in them also did well as civil servants, or that those who did badly became bad civil servants.

May I also contribute a small but important correction to your statement that "the qualities required by a third secretary are very different from those required by an ambassador," by suggesting that this should more correctly read "some of the qualities"? In any case, the usefulness of the concept of "qualities" for a selection problem of this type is very much open to doubt. Neither a third secretary nor an ambassador is required to display certain fixed qualities. He is required to perform effectively a certain rôle, and people with very

diverse qualities may be equally effective in performing a given rôle. The function of the selection procedure is to attempt to predict an individual's effectiveness in the rôle in which he is being considered, regardless of the many possible variations in combinations of qualities which might enable him to be effective in that rôle.

London, E.C.4.

G. R. HARGREAVES.

## Parliament

### QUESTION TIME

#### Valid Certificates

Sir ERNEST GRAHAM-LITTLE asked the Minister of National Insurance whether under the new National Health Service private patients of doctors who had not joined that service would be able to claim sickness benefits on presenting their private doctor's certificates, or whether they must present the special certificate forms provided by the new service; and whether in that event doctors not taking part in the service would be supplied with these forms on request to the National Insurance office, or whether that office would accept certificates not on official forms from doctors practising outside the service.—Mr. TOM STEELE replied: Certificates signed by any qualified medical practitioner will be accepted in support of a claim for sickness benefit. It is not essential that the certificate should be on the standard official form, but it is convenient that they should be since this form also contains a claim for benefit. Medical practitioners practising outside the National Health Service will be able to obtain these forms by applying to the executive councils set up under the Act.

#### Specialists' Remuneration

Sir ERNEST GRAHAM-LITTLE asked the Minister of Health if he would now publish the interim terms of remunerations for specialists, since these had been made known to regional boards, but not to those who were to be asked to serve under the National Health Service Act as specialists.—Mr. ANEURIN BEVAN replied: Whole-time specialists who, by virtue of section 68 of the Act, are transferred on July 5 to the employment of a regional hospital board or a board of governors of a teaching hospital will continue, for the time being, to receive the same remuneration as they did before the appointed day. Part-time specialists who, in general, are not so transferable and whose appointments will therefore lapse on July 5, will be offered temporary contracts remunerated at the flat rate of £200 per annum for each half-day per week up to a maximum of £1600. These terms of remuneration are broadly based on current practice where part-time visiting staff are paid for their hospital appointments. They are designed simply as interim payments on account until the recommendations of the Spens Committee have been discussed with the profession and a new scheme of remuneration worked out. As soon as that is done adjustments will be made so as to apply the new scheme as from July 5 (even if the discussions are prolonged beyond that date) and to do so in such a way as to bring the specialist's remuneration up to a level appropriate to his seniority and experience.

#### National Insurance Entrants

Sir WALDRON SMITHERS asked the Minister of National Insurance how many persons were due to register under the new Insurance Act on July 5; and how many had, in fact, registered at the latest available date.—Mr. STEELE replied: It is estimated very approximately that these will number rather over 3 millions. Up to last week about 1,400,000 new entrants of all classes had applied for National Insurance cards. Of these just over 500,000 were in the self-employed and non-employed classes.

#### Artificial Limbs

Mr. E. A. BRAMALL asked the Minister of Pensions what action he proposed to take to extend the existing service for the provision and maintenance of artificial limbs in view of the extra burden which would fall on this service under the National Health Service.—Mr. G. BUCHANAN replied: Arrangements are being made to open additional limb centres and the Ministry's contractors are extending their services to meet the extra call on them.

#### Pension Entitlement in Cancer Cases

Mr. G. R. CHETWYND asked the Minister of Pensions whether he would make a statement on applications for pension in

respect of cancer, in view of Mr. Justice Denning's recent judgment in the case of *Lee v. Minister of Pensions*.—Mr. BUCHANAN replied: I have read the judgment in the case of *Lee* and note that the appeal was allowed primarily on the grounds that an earlier diagnosis of cancer and operative treatment might have prolonged life. The reasons given by the learned judge for allowing Mrs. Lee's appeal do not constitute any new approach to pension entitlement in cancer cases. Although, with very rare exceptions, cancer is authoritatively held to be not caused by war service, rejection of applications for pension is not automatic. All cases are examined sympathetically to see whether there was delay in diagnosis or treatment due to war service which may have hastened death. Where there has been such delay my department do not hesitate to grant pension. Indeed an appreciable number of cases have been admitted on this basis.

#### International Children's Emergency Fund

Mr. R. W. SORENSEN asked the Secretary of State for Foreign Affairs whether, in view of the amount subscribed to the Lord Mayor's Fund now being over £500,000, the £100,000 promised conditionally by His Majesty's Government had now been donated; whether both these amounts had now been received by the International Children's Emergency Fund along with all other international contributions; and to what extent H.M. Government had control of the British contribution.—Mr. ERNEST BEVIN replied: A supplementary vote will shortly be laid before the House requesting that the contribution of £100,000 promised conditionally by His Majesty's Government when the amount subscribed by the Lord Mayor's Fund reached £500,000 should be transferred to the credit of the International Children's Emergency Fund. It is proposed to place this amount, together with 50% of the total subscribed to the Lord Mayor's Fund, in a special account of inconvertible sterling in the name of the International Children's Emergency Fund. H.M. Government will retain control over the expenditure of these funds.—Mr. SORENSEN: May I ask whether H.M. Government are likely to make any further contribution either now or after further monies have been raised through private sources or otherwise? Would the Foreign Secretary say whether there is likely to be information regarding the actual spending of this money?—Mr. BEVIN: I would like to have notice of these questions. With regard to the additional grant, I very much doubt whether the Chancellor would be willing to contribute further.

#### Bacteriological Warfare

Mr. EMRYS HUGHES asked the Minister of Defence what investigations he was conducting into the question of bacteriological warfare.—Mr. A. V. ALEXANDER replied: The possibility that bacteria may be used in a future war is not being overlooked. Researches are being conducted so that we may be ready to meet any situation which may arise.—Mr. HUGHES: Does that mean we are investigating the question of bacteriological warfare purely from a defence point of view, or are we preparing to use this method of warfare against other nations?—Mr. ALEXANDER: My answer means what it says.

#### Limb Amputations

Mr. WILLIAM TEELING asked the Minister of Health what would be the position under the new health service of people about to have limbs amputated; and whether they would be required to have them amputated in certain hospitals designated by his department or the Ministry of Pensions in order that such amputations should be of a standard nature, in order that as far as possible ready-made limbs might be supplied to them.—Mr. BEVAN replied: Amputations will be performed how and where the patient's needs require in the judgment of the surgeon in charge of him.

#### Sale of Medical Practices

Sir ERNEST GRAHAM-LITTLE asked the Minister whether, in view of the fact that general practitioners might carry on private practice in conjunction with public practice under the National Health Service Act, 1946, he would introduce amending legislation to enable them to dispose of the goodwill of their private patients.—Mr. BEVAN replied: No, Sir. But I would point out that full compensation is provided to cover both elements in these combined practices.

#### Registered State Nurses

Replying to a question Mr. BEVAN stated that the number of State-registered nurses on the register of the General



Nursing Council for England and Wales on April 30, 1948, was 125,994. A year earlier the number was 121,607.

#### Analgesic Apparatus for Midwifery

Mr. R. W. SORENSEN asked the Minister what further progress had been made in providing analgesic apparatus in hospitals and for use by midwives; whether reports continued to confirm its efficacy; and whether the provision of this or an improved alternative service to women in confinement in hospitals depended on the decision of the medical superintendent or would be made compulsory as soon as sufficient supplies were available.—Mr. BEVAN replied: The apparatus is normal equipment in hospitals and 2820 sets have been supplied for domiciliary midwives who used them for 43,683 cases in 1947 against 20,507 in 1946. Reports remain favourable. Whether a hospital patient should be given analgesia must continue to be decided by the doctor in clinical charge of her.

#### Medical Inspection of School-children

Mr. A. D. DODDS-PARKER asked the Minister of Education what instructions had been issued to enable parents to see the main school medical report M.10 on children.—Mr. GEORGE TOMLINSON replied: None, Sir. The general practice, with which I agree, is for the parent to be told the findings of the medical inspection, but I consider that it must lie in the discretion of the doctor to decide whether to tell the parent all that he has recorded.

## Obituary

### DANIEL DOUGAL

M.C., M.D. MANC., F.R.C.O.G.

Prof. Daniel Dougal, who died on June 4, was a fitting successor to a line of eminent gynaecologists who have raised the standard of this subject in Manchester—Charles White and John Hull in times gone by, and more recently Lloyd Roberts, Cullingworth, Sinclair, Donald, Fothergill, Walls, Arnold Lea, and Clifford.

He came of a Scottish family and was himself born at Strathaven in Lanarkshire in 1884, but he grew up in Blackburn where his father, Dr. James Dougal, was in practice. He was educated at the Manchester Grammar School and the Manchester University, where he had a distinguished career, winning many prizes, taking his

medical degrees in 1906, and gaining a gold medal in 1913 for his M.D. thesis on *A New Method of Pelvimetry*. From 1908 to 1913, while holding resident posts at Manchester Royal Infirmary, Manchester Northern Hospital, and St. Mary's Hospitals, he laid the foundation of his study and practice of the diseases of women. His promise was soon recognised, and in 1914 he was appointed gynaecological surgeon to the Northern Hospital and pathologist to St. Mary's Hospitals. In this year, too, he began to practise as a consultant. Before war broke out he had time to prove the soundness of his clinical and administrative

qualities by reorganising the laboratory system at St. Mary's.

In 1919 he joined the staff of St. Mary's Hospitals; six years later he became assistant gynaecological surgeon to the Royal Infirmary, and in 1943 he succeeded Sir William Fletcher Shaw as senior surgeon. In 1927 he had been appointed to the chair of obstetrics and gynaecology at the university, and this post he held till his death. His teaching was marked by the care he took in making things simple for the students. The helpful summaries of his lectures which he distributed to them, would, if published, have constituted an admirable textbook. He also used effectively in his lectures lantern slides, cine films, wet specimens, and demonstration models. A colleague writes: "Dougal was a sound gynaecologist with an inventive mind, as is

shown by the many papers he wrote, but probably the memory of him which will last best is his management of the department of obstetrics and gynaecology. The success of this department was his main object. He thought out what was for its advantage and he worked relentlessly in carrying out his ideas. He knew what he wanted and carried it through in the face of inertia or even opposition. The gynaecological museum has the impress of his master hand, and the departmental library which he did much to collect and house is hardly excelled by any in England."

Apart from his own specialty, military medicine was his great occupation. From 1901, when he first joined the combatant auxiliary forces, to the time of his death, he was, with very small breaks, busy with Army efficiency. At first in the ranks, later as an officer, he served with the university corps. In the earlier war he served in France from 1915 to 1917, for part of the time as D.A.D.M.S. of the 34th Division. Twice he was mentioned in despatches and he was awarded both the Military Cross and the Croix de Guerre. On the outbreak of the second war he was in charge of the Military Hospital at Davyhulme near Manchester.

In his later years Professor Dougal held many distinguished appointments. He had examined for the universities of Cambridge, Liverpool, and Wales and for the Conjoint Board. He was a director of the *Journal of Obstetrics and Gynaecology of the British Empire* and chairman of its editorial committee. He was also a past president of the Manchester Pathological Society, and of the North of England Obstetrical and Gynaecological Society, and a foundation fellow and vice-president of the Royal College of Obstetricians and Gynaecologists.

K. V. B. writes: "Dougal led a full and valuable life which might be the envy of most men. But to those who knew him well these were not even his real strengths. These lay in his inherent capacity for control. He not only taught students, he controlled them and their activities—their welfare. The resident and junior members of the staff looked to him for the control of their future course of action. He not only contributed to the agenda of societies, he controlled them in such a way as to form their main basis. He was not only the senior honorary for many years to St. Mary's and a partaker in the routine work thereof; he was the natural controller, from the medical aspect, of this institution and those belonging to it. No major issue was decided without his knowledge and the assurance which came from it. His colleagues both within and without these walls recognised this attribute and a peculiar trust was vested in him. He was a natural stabiliser of the institutions, committees, and societies to which he belonged, for his was the mind of the consistent worker of sure insight without aspiration to spasmodic brilliance or showmanship.

"His control of the St. Andrew's Society, of which for many years he was president, did much to fill his spare moments, but it was typical of Daniel Dougal that his personal social life remained centred upon the society of a group of old friends of long standing, a deep interest in reading and the collection of old pewter, and the love, companionship, and help of his wife. Those of us who worked with him feel that he has gone at too early an age and at a time when his gifts would have been invaluable to medical administration. It is not given to every school—or generation—to possess a man of such qualities."

Professor Dougal married in 1916 Lillian Newton, daughter of John Tweddell of Newcastle-on-Tyne, who survives him. A memorial service was held in the chapel of the Royal Infirmary on June 11.

### ARNOLD WHITAKER OXFORD

D.M. OXFED

THE Rev. Arnold Oxford, who died on May 30 at the age of 93, was an able and influential man who yet remained something of an enigma to most people; for, though he often brought about important changes and appointments, he himself always remained in the background.

Born at Keynsham in 1854, he was educated at the University of Oxford, and shortly after graduation he was ordained in the Church of England. His interest in



[F. S. Schmidt]

social problems led him to study medicine, and he became a student at Charing Cross, where he was already a member of the lay council. In 1897 he qualified L.S.A., taking the B.M. the following year, and the D.M. in 1899. Though he did not practise medicine in the ordinary sense he continued to use medicine as the background to his social work, and he gave devoted service to St. Mark's Hospital and the Samaritan Hospital for Women, where he was for many years chairman of the board. During the 1914-18 war he worked at Charing Cross Hospital in the administrative post of resident medical officer to release a younger man for service. He was also one of the founders of the Incorporated Society of Chiropodists, now embodied in the Society of Chiropodists, and he wrote a *Concise Anatomy of the Foot* for the use of chiropodists.

A prominent mason, he reached the highest rank in the order, and he wrote an authentic history of Masonry. His other publications included *Notes from a Collector's Catalogue* (1909) and *Fountains Abbey* (1910). His *Bibliography of English Cookery Books* (1912) included the housewife's simples and the "kitchen physic" of such distinguished colleagues as Andrew Boorde, Thomas Muffett, and A. Hunter, F.R.S.

#### THE LATE PROFESSOR SEBRECHTS

Mr. R. Rutherford writes: Whilst serving with 21 Army Group near Bruges I was privileged to visit on many occasions the hospital and clinic in which Joseph Sebrechts worked. It was necessarily a time of austerity, which affected the tools for doing the job. Plaster-of-paris was unobtainable: ceiling plaster of very inferior quality was used instead. Proper rubber gloves did not exist: he operated in thick gloves of the type used for post mortems. I watched him do a partial gastrectomy. He dissected with great skill, using a huge pair of scissors, curved on the flat, just open and no more. It was uncanny to watch him stripping individual vessels and tying them; every movement was deliberate and seemed leisurely, as indeed tying a ligature with P.M. gloves must be. The operation was completed in 55 minutes. I saw him complete an Albee graft from tibia to spine in 25 minutes. He must have been over 70 then.

He trained his assistants meticulously, and maintained that they should be better than their master—and this in their hearing. His theatre staff-work was impeccable; his spinal anaesthetics were given by himself. During the operation a nun supervised an intravenous saline drip; and if the patient appeared to him to be restless Sebrechts ordered a small dose of a hyoscine derivative to be injected into the rubber tube of the drip. Of his two assistants, one helped Sebrechts, while the other took charge of swabs and ligatures. Ward work was done solely by nuns.

He conversed with his visitors during operations, explaining his methods and reminiscing from a vast store of clinical experience. He told me he often visited foreign clinics and had watched Polya at work in obscurity. He said that every set operation was standardised in his clinic and practised for 10 years; it was then reviewed in the light of practice in other clinics and his own experience, and if necessary remodelled.

He was loved by the people of Bruges; and on one occasion, many years ago, when he was at death's door, the inhabitants joined in a mass pilgrimage for his recovery. The doors of his clinics were opened wide to visiting Service colleagues; his hospitality and charm were boundless. He hands down a legacy of healing to those who were privileged to be his disciples.

Dr. C. J. PATTEN, emeritus professor of anatomy in the University of Sheffield, died on June 13 at the age of 78. An enthusiastic ornithologist, he had made a special study of bird migration.

THE death is announced on June 8 of Dr. A. M. GOSSAGE, consulting physician to the Westminster Hospital and to the Princess Elizabeth of York Hospital. He was in his 86th year.

Dr. HENRY JELLETT, late consulting obstetrician to the health department of New Zealand and a former master of the Rotunda Hospital, Dublin, died at Christchurch on June 8.

## Notes and News

### SUPPLEMENTARY OPHTHALMIC SERVICES

It is understood that the ophthalmic services committee of each executive council will be required to publish a list of medical practitioners and opticians, having the prescribed qualifications, who undertake to test sight on the terms obtaining in the committee's area. The expression "medical practitioner having the prescribed qualifications" means a medical practitioner who has:

(a) completed an academic or postgraduate course in ophthalmology approved by the committee hereinafter in this paragraph mentioned, and received a diploma or certificate in respect of this course; or

(b) held for a period of two years an appointment as an ophthalmic surgeon or assistant ophthalmic surgeon on the staff of an eye hospital or a hospital having a special eye department; or

(c) held any appointment for a period of two years affording special opportunities for acquiring the necessary skill and experience of the kind required for the services to be rendered; or

(d) had, immediately before the appointed day, his name included in the list of medical practitioners prepared by either the B.M.A., the National Ophthalmic Treatment Board, or the Incorporated Ophthalmic Council, for use by approved societies for the purpose of ophthalmic benefit under the National Health Insurance Act, 1936;

"and who shall, to the satisfaction of the Minister, acting on the advice of a committee to be recognised by him for the purpose of approving such qualifications, have had adequate including recent experience."

The central professional committee referred to above has been recognised by the Minister, and is composed of practitioners nominated by the B.M.A. and the Faculty of Ophthalmologists. This committee has the duty of compiling a central list of medical practitioners having the prescribed qualifications. The committee therefore invites applications from all ophthalmic medical practitioners to be included in the central list, which is an essential preliminary to inclusion in local lists for which separate application must be made to the ophthalmic services committees of the executive councils concerned. Inclusion in the central list is entirely without prejudice to future action, and it will be open to every practitioner to decide, when he knows the terms of service, whether he will take part in the supplementary ophthalmic service or not. Ophthalmic practitioners should not, however, await the publication of the terms of service before applying for recognition by the central committee. All ophthalmic practitioners are therefore requested to apply as soon as possible to the Secretary, Ophthalmic Qualifications Committee, B.M.A. House, Tavistock Square, London, W.C.1, giving the necessary evidence that they comply with the criteria outlined above. It is particularly important that details of recent experience should be included.

### A NEW POLIOMYELITIS FILM

At the height of last year's poliomyelitis epidemic the Ministry of Health had a short film made to remind practitioners of the importance of early diagnosis.<sup>1</sup> Despite the haste in which the film was made, it succeeded admirably in this purpose; and in the first month it was seen by 17,500 doctors. Encouraged by its success, the Ministry decided on a more measured production. The new film—"Polio: Diagnosis and Management"—has been produced by the Crown Film Unit and directed by Geoffrey Innes. This is a more ambitious production than the first. It sets out to tell the history of one case—though with digressions—from early days until resettlement at work. Small points are open to criticism: it seems strange that the Ministry should endorse, in the title and again in the dialogue, the abbreviation "polio"; the time given to tests of muscle function is perhaps a shade long for some tastes; and the rather haphazard examination of the nervous system shown in the patient's home would be hardly acceptable at Queen Square. But only the captious would seek to make much of these minutiae: this is a first-class production, balanced and enthralling in almost each of its 60 minutes' run. There is nothing highfalutin' about it, but what it does say it says well; and students of technique will be especially interested in the clever diagrammatic representation of the spread of infection in a family.

The film may be had, from about June 22, in 35 mm. and 16 mm. from the Central Film Library, and on the mobile film units of the Central Office of Information.

1. See *Lancet*, 1947, ii, 339.

## ANNALS OF THE COLLEGE

THE appeal launched in 1945 by the Royal College of Surgeons of England for funds to rebuild the college after its disastrous bombing revealed a keen and widespread desire for news of past, present, and future events at Lincoln's Inn Fields. A year ago, therefore, the council started a monthly journal, the *Annals of the Royal College of Surgeons of England*, in which have appeared selections from the lectures delivered at the college, accounts of current functions, and fixture-lists for a month ahead. The library, whose adventures during the war were described by Mr. W. R. Le Fanu, the librarian, in the first number, has since been discussed from various aspects; and lately, in a series of illustrated articles entitled "Observables," "A.W.-J." has been describing the college's heirlooms. Perhaps the time has now come for an illustrated account of the repairs completed or still projected.

On June 10 the editorial committee held a reception at the college, and Sir Cecil Wakeley, the committee's chairman, received the congratulations of the large number of guests on the success of this venture.

## MEDICAL RECRUITS

LAST week we reported (p. 930) that the Central Medical War Committee had been asked to accept recommendations by the Medical Priority Committee for measures to prevent the supply of general-duty medical officers to the Forces falling short of requirements. Accordingly, the Central Medical War Committee has notified hospitals that during the second half of this year doctors who are liable for military service will be recruited on completion of six months' tenure of a hospital post. A doctor whose "A" appointment ends before he has occupied it six months will be allowed to occupy another "A" appointment for the remainder of the six months. In future all doctors liable for military service who qualify under the age of 26 will be recruited before their 26th birthday, even if this prevents them from holding or completing the normal six months in an "A" post. Appeal against recruitment may be lodged only on the grounds of conscience or exceptional personal hardship.

## University of Oxford

On June 5 the following degrees were conferred:

*B.M.*—W. E. D. Markland, Sheila M. Tyrrell.\*  
\* In absentia.

## Royal College of Surgeons of England

At a meeting of the council of the college held on June 10 with Lord Webb-Johnson, the president, in the chair, Prof. Lambert Rogers and Mr. R. P. Scott Mason were re-elected members of the court of examiners, and the following examiners were appointed for the ensuing year:

*Fellowship.*—Ophthalmology: Dr. S. P. Meadows. Anatomy: Sir Cecil Wakeley, Prof. H. A. Harris, Mr. E. C. B. Butler, Prof. James Whillis. Applied physiology and pathology: Prof. Geoffrey Hadfield, Prof. Samson Wright, Prof. J. H. Dible, Prof. W. R. Spurrell.

*Diploma of L.R.C.P., M.R.C.S.*—Elementary biology: Mr. Wilfrid Rushton, D.Sc., Mr. J. H. Elgood, Mr. Alan Fisk, Mr. Frederick Segrove. Anatomy: Mr. A. M. A. Moore, Dr. D. V. Davies, Mr. R. J. Last. Physiology: Prof. D. T. Harris, Prof. Henry Barcroft. Midwifery: Mr. A. O. Gray, Mr. Norman White, Mr. H. G. Kirwan-Taylor, Mr. Henry Evers. Pathology: Mr. Lennox Broster, Mr. R. J. McNeill Love, Dr. J. Oliver, Dr. H. A. Magnus.

*Diploma in Public Health.*—Preliminary: Dr. Ian McCracken; Part I, Dr. J. D. Benjafield; Part II, Dr. C. O. S. B. Brooke.

*Diploma in Tropical Medicine and Hygiene.*—Sir Philip Manson-Bahr, Colonel Sydney Smith.

*Diploma in Ophthalmic Medicine and Surgery.*—Part I, Mr. J. H. Doggart, Mr. G. J. O. Bridgeman; Part II, Prof. Arnold Sorsby.

*Diploma in Psychological Medicine.*—Part I, Dr. Denis Brinton.

*Diploma in Laryngology and Otolaryngology.*—Part I, Mr. C. A. Keogh, Mr. Geoffrey Bateman; Part II, Mr. J. H. Cobb.

*Diploma in Medical Radio-Diagnosis.*—Part I, Prof. F. L. Hopwood, D.Sc.; Part II, Mr. J. L. A. Grout.

*Diploma in Medical Radiotherapy.*—Part I, Professor Hopwood; Part II, Mr. I. G. Williams.

*Diploma in Anaesthetics.*—Part I, Dr. E. S. Rowbotham, Dr. J. F. Taylor; Part II, Dr. W. A. Low, Dr. R. H. Boggan.

*Diploma in Child Health.*—Dr. Wilfrid Sheldon, Dr. A. D. C. Bell.

*Diploma in Physical Medicine.*—Part I, Dr. Philippe Bauwens, Mr. A. M. A. Moore; Part II, Mr. N. St. J. G. D. Buxton, Dr. Frank Cooksey.

*Diploma in Industrial Medicine.*—Part I, Dr. Arthur Massey.

Prof. W. E. Gye, F.R.S. and Dr. Cuthbert Dukes were appointed Imperial Cancer Research Fund lecturers for the ensuing year. A Leverhulme research scholarship was awarded to Mr. L. J. Ray.

The following were co-opted as members of the council for the ensuing year:

Dr. H. Guy Dain (general practice), Mr. J. M. Wyatt (gynaecology and obstetrics), Mr. V. E. Negus (otolaryngology), Dr. A. D. Marston (anaesthetics), Mr. J. H. Doggart (ophthalmology), Prof. R. V. Bradlaw (dental surgery), Prof. B. W. Windeyer (radiology).

A diploma of membership was granted to J. R. Bennett, and a diploma of fellowship to Marco Caine.

The following diplomas were granted jointly with the Royal College of Physicians:

*D.M.R.*—Loraine L. Alexander, N. B. Atkin, C. C. Burkell, L. S. Green, Alexander Greig, P. S. Huck, G. M. King, A. W. O'Farrell, H. E. C. Walls, A. H. N. Welikala.

*D.M.R.-D.*—William Campbell, D. M. Coates, J. G. L. Cole, T. N. Cowie, William Davidson, Arthur Griffiths, G. de B. Hinde, R. D. Hoare, J. F. K. Hutton, J. A. Kennedy, H. P. Kent, C. D. T. MacLean, S. J. Meyerson, W. L. Munro, R. G. W. Ollerenshaw, D. A. R. Orr, D. E. Paterson, J. E. A. Paterson, Ifan Pierce-Williams, U. S. Prasad, Frank Reid, James Richard, M. I. Robinson, G. D. Scarrow, J. M. Stewart, G. U. Thomas, T. J. Thomas, J. L. G. Thomson, W. N. Thomson, W. I. Walker, G. N. Weber, John Winter.

## Royal College of Physicians of Ireland

The following have been admitted to the fellowship:

R. S. W. Baker, M. D. Hickey, F. E. Pilkington, C. B. Robinson.

The following have been admitted to the membership:

J. G. Callanan, Stanley Davis, Laurence Godfrey, K. W. Hazratji, P. J. G. Quinn, Michael Brown, D. C. Connolly, J. O. Doyle, M. F. Healy, Thomas Lynch, Joseph McNutt, J. P. Malone, Raghunath Sahu, R. H. O'Hanlon.

## Royal College of Surgeons in Ireland

The following officers have been elected for 1948-49: president, H. S. Meade; vice-president, W. Pearson; members of council, R. A. Stoney, J. F. L. Keegan, E. L. Sheridan, H. Stokes, A. A. McConnell, J. F. Devane, W. Doolin, T. O. Graham, F. Gill, W. C. P. Smyly, I. Fraser, A. B. Clery, T. G. Wilson, A. S. F. O'Carroll, R. R. Woods, M. P. Burke, T. A. Bouchier-Hayes, N. A. Kinnear, and J. H. Coolican.

## Royal Society of Medicine

The pathology section will hold a laboratory meeting at the Central Public Health Laboratory, Colindale Avenue, London, N.W.9, on Tuesday, June 22, at 4.30 p.m.

## Faculty of Homœopathy

The annual assembly of the faculty will be held at the London Homœopathic Hospital on Wednesday, June 23, at 5 p.m., when there will be a discussion on the National Health Service Act as it affects homœopathic practice.

## King Edward VII Convalescent Home for Officers

Mr. A. E. Porritt and Mr. H. Osmond Clarke have been appointed to the civil consulting staff of this home at Osborne, Isle of Wight, in succession to Sir Claude Frankau and Mr. Rowley Bristow.

## Oxford Graduates Medical Club

The club will hold its first dinner since the war at Christ Church, Oxford, on Friday, July 16, at 7.30 p.m. Prof. A. W. M. Ellis will be in the chair. Applications for tickets should be made to Mr. E. A. Crook, 149, Harley Street, London, W.1, not later than July 1.

## Association of Army Psychiatrists

The fifth reunion of Army Psychiatrists will take place at Slater's Restaurant, 18, Kensington High Street, London, W.8, on Saturday, July 10, at 7.30 p.m. Details may be obtained from the hon. secretary, Lieut.-Colonel J. C. Penton, R.A.M.C., 1, Gatehill Road, Northwood, Middlesex.

## Choosing a Doctor

The Minister of Health is arranging for lists of doctors who are taking part in the National Health Service to be available in post offices, public libraries, and similar places, as from June 21 or soon after. People who have difficulty in selecting a doctor should get in touch with their local executive council (the post office will give the address).

## Gerontological Conference

The Society for Research on Ageing will hold a conference on Wednesday, July 7, 11 a.m., at 1, Wimpole Street, London, W.1. Papers will be read by Sir Frederick Bartlett, F.R.S., Prof. E. C. Dodds, F.R.S., Mr. F. Bourliere, Dr. L. Cosin, Dr. F. Denz, Dr. E. Geiringer, Mr. V. Korenchevsky, D.Sc., and Dr. O. Olbrich.

**Guy's Hospital**

On Friday, July 9, at 5 P.M., Prof. E. B. Astwood (Boston) will deliver the second Addison lecture at the medical school. He is to speak on the Medical Treatment of Hyperthyroidism. Sir Charles Harington, F.R.S., will be in the chair.

**Conference on War-handicapped Children**

This conference, sponsored by UNESCO, is to be held at Trogen, Switzerland, from July 5 to 11. Reports by delegates from nine European countries will form the basis of a study to be prepared by UNESCO.

**Conference on Maternity and Child Welfare**

The annual conference arranged by the National Association of Maternity and Child Welfare Centres and for the Prevention of Infant Mortality will be held this year at Friends House, Euston Road, London, N.W.1, from June 23 to 25. Mr. Aneurin Bevan, the Minister of Health, will preside and the general theme will be the State and Family Life. Speakers will include Dr. J. A. Scott and Dr. J. L. Burn. Tickets may be had from the secretary of the association, 5, Tavistock Place, W.C.1.

**Dentists' Opposition to Service**

The council of the British Dental Association is reported by the *Times* (June 15) to have stated that it cannot recommend members to join the National Health Service, owing to the Minister of Health's refusal to grant any of the principles laid down by the association. These principles are: (1) freedom to treat patients without prior approval of a third party; (2) grant-in-aid, by which any Government grant would be paid towards fees agreed between patient and dentist; (3) priority treatment of adolescents; and (4) security against a decision by the Minister to establish a State salaried service by regulation, or arbitrarily to suspend or amend existing regulations. The council also objects to the proposed scale of fees. Members of the association will meet at Birmingham today, Saturday, to decide whether a plebiscite shall be taken. On Sunday there will be a meeting of the representative board, which is expected to approve the council's decision not to recommend members to join the service.

**British Medical Association**

The association is offering the following prizes during the coming year:

*Sir Charles Hastings Clinical Prize (50 guineas).*—The purpose of this prize is the promotion of systematic observation, research, and record in general practice. It will be awarded for the best essay which includes personal observations and experiences collected by the candidate. Any member of the association who is engaged in general practice is eligible.

*Middlemore Prize (£50).*—The subject chosen for the essay for this prize in 1949 is the Value of Orthoptics in the Treatment of Squint.

*Katherine Bishop Harman Prize (£75).*—This prize, which was founded to encourage research into the disorders incident to maternity, is open to any medical practitioner registered in the British Empire. Competitors are free to select the work they wish to present in their essay, provided it falls within the scope of the prize.

Essays must reach the secretary of the association by Dec. 31, 1948.

The essays for all three prizes should be submitted to the secretary of the association, B.M.A. House, Tavistock Square, London, W.C.1, not later than Dec. 31, 1948.

**Appointments**

BRYNING, F. A., M.B. Lond.: medical superintendent (group 1), Hackney Hospital (L.C.C.).

HARRISON, R. J., M.B. Lond., M.R.C.P.: senior physician, Fulham Hospital (L.C.C.).

OSWALD, N. C., M.D. Camb., F.R.C.P.: asst. physician, Brompton Hospital, London.

PAGE, A. P. M., M.D. Lond., M.R.C.P., D.C.H.: paediatrician, City of Nottingham and Nottingham Hospitals.

**Hospital for Sick Children, Great Ormond St., London**

HALL, M., M.D., D.C.H.: M.O., tuberculosis diagnostic clinic.

MARTIN, J. K., M.B. Lond., D.R.C.O.G., D.C.H.: asst. receiving-room physician.

PERCIVAL, R. H., B.M. Oxid, F.R.C.S.: receiving-room surgeon.

POWELL, B. W., M.B. Camb., M.R.C.P., D.C.H.: medical registrar and pathologist.

RICKHAM, P. P., F.R.C.S.: asst. receiving-room surgeon.

TODD, P. G., M.D. Lond., M.R.C.P., D.C.H.: outpatient medical registrar.

VICKERS, T. H., M.B. Sydney: asst. morbid anatomist.

**Colonial Service:**  
BROWNE, JAMES, M.B. Belf.: asst. superintendent, Mental Hospital, Singapore.

CRAIG, J. K., M.B. Dubl.: M.O., Kenya.

TODD, C. H., M.B. Belf.: M.O., Seychelles.

**Diary of the Week**

JUNE 20 TO 26

**Monday, 21st**

ROYAL COLLEGE OF PHYSICIANS, Pall Mall East, S.W.1  
5 P.M. Dr. R. D. Lawrence: Diabetes—Newer Aspects. (First lecture.)

ROYAL COLLEGE OF SURGEONS, Lincoln's Inn Fields, W.C.2  
5 P.M. Mr. Denis Browne: Hernia and Undescended Testicle.

**Tuesday, 22nd**

ROYAL COLLEGE OF PHYSICIANS  
5 P.M. Dr. Lawrence: Diabetes—Newer Aspects. (Second lecture.)

ROYAL COLLEGE OF SURGEONS  
5 P.M. Mr. T. Holmes Sellors: Chest Surgery.

INSTITUTE OF DERMATOLOGY, 5, Lisle Street, W.C.2  
5 P.M. Dr. J. E. M. Wigley: Toxic Eruptions.

EDINBURGH POST-GRADUATE BOARD FOR MEDICINE  
5 P.M. (Royal Infirmary.) Prof. R. E. Tunbridge: Clinical Problems of Poliomyelitis.

**Thursday, 24th**

ROYAL COLLEGE OF PHYSICIANS  
5 P.M. Sir Philip Manson-Bahr: Lesson of Tropical Medicine. (Second lecture.)

MEDICO-LEGAL SOCIETY  
8 P.M. (26, Portland Place, W.1.) Mr. G. D. Roberts, K.C.:  
Rex v Camb.

**Friday, 25th**

ROYAL COLLEGE OF PHYSICIANS  
5 P.M. Prof. E. C. Dodds, F.R.S.: Sterol Metabolism in Normal and Pathological Conditions.

UNIVERSITY OF DURHAM  
5 P.M. (Royal Victoria Infirmary, Newcastle-on-Tyne.) Mr.  
R. Guy Pulvertaft: Tendon Surgery in the Hand.

**Births, Marriages, and Deaths****BIRTHS**

ARDEN.—On June 10, at Bournemouth, the wife of Surgeon Lieut.-Commander L. D. Arden, R.N.—a son.

BLAINKIN.—On June 12, in London, Dr. Lilian Rivlin, wife of Mr. George Blainkin—a daughter.

CRANE.—On June 11, Dr. Nest Crane (née Llewellyn), the wife of Dr. J. E. Crane, Carmarthen—a daughter.

DEENY.—On May 3, at Workop, Notts, the wife of Dr. P. H. Deeny—a daughter.

FLOWERDEW.—On June 4, at Nairobi, Kenya, the wife of Dr. F. Dighy Mackworth Flowerdew—a daughter.

GIBB.—On June 3, the wife of Dr. H. A. Gibb, Lanarkshire—a son.

HALDANE.—On June 6, Dr. Vanora Haldane (née McWilliam), wife of Dr. James Howie Haldane, M.C.—a daughter.

MATTHEWS.—On June 8, in Edinburgh, the wife of Dr. J. D. Matthews—a son.

MOREL.—On June 3, at Barnstaple, the wife of Mr. Mervyn Morel, F.R.C.S.—a son.

PATON.—On June 8, at St. Mary's, Isles of Scilly, the wife of Dr. A. Paton—a son.

REYNOLDS.—On June 6, at Ugley, Bishop's Stortford, the wife of Dr. S. R. Reynolds—a daughter.

TOMLINSON.—On June 10, the wife of Dr. A. J. H. Tomlinson, Shipley, Yorks—a son.

TURNER.—On June 4, the wife of Dr. A. C. Turner, Herne Bay, Kent—a daughter.

**MARRIAGES**

BINNING—REPARD.—On May 27, at Hove, Rex Binning, M.R.C.S., to Nancy Louise Repard.

FOSTER—HOLLAND.—On June 5, at Wendens Ambo, Robert Marius Foster, M.B., surgeon lieutenant, R.N.V.R., to M. Rhona Holland.

MACLAINE—JOYCE-CLARKE.—On June 3, in London, Quintin MacLaine, M.B., major R.A.M.C., to Daphne Joyce-Clarke, flight-officer, W.A.A.F.

PAYNE—MITCHELL.—On June 8, at Sanderstead, Arthur Dudley Payne, M.B., to Helen Mitchell.

PURVES-STEWART—REISS.—On June 9, Sir James Purves-Stewart, K.C.M.G., C.B., F.R.C.P., to José Reiss.

ROWLANDSON—FIRTH.—On June 5, at Cambridge, Richard Rowlandson, F.R.C.S., to Rosamund Violet Firth.

**DEATHS**

BUCKLAND.—On June 5, at Dunedin, New Zealand, Henry Scott Buckland, M.B. Camb.

AMPBELL.—On June 1, in Johannesburg, South Africa, Andrew Campbell, M.B. Edin., F.R.C.S.E.

CLAY.—On June 12, at Whitstable, Francis Edmund Clay, M.R.C.S., aged 75.

DINGLEY.—On June 7, at Wednesbury, Edward Alfred Dingley, M.D. Lond., J.P., aged 88.

GOSSAGE.—On June 8, in London, Alfred Milne Gossage, C.B.E., D.M. Oxid, F.R.C.P., aged 85.

JELLETT.—On June 8, at Christchurch, New Zealand, Henry Jellett, M.D. Dubl., F.R.C.P.I.

LLOYD.—On June 11, at Harrow-on-the-Hill, William Lloyd, L.R.C.P.E.

MCCANN.—On June 11, Ivan Bailor McCann, M.R.C.S., aged 52.

MOTT.—On June 11, at Hurnway, Christchurch, Hants, Georgiana Alexandra, widow of Sir Frederick Mott, K.B.E., F.R.C.P., F.R.S.

PATTEN.—On June 13, Charles Joseph Patten, B.A., M.D., S.C.D. Dubl., of Farnham, Surrey.

WALTON.—On June 8, in London, Harry Walton, B.A. Camb., M.R.C.S., D.A., aged 43.

# THE LANCET

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No. 6513

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**NEURALGIC AMYOTROPHY  
 THE SHOULDER-GIRDLE SYNDROME**

**M. J. PARSONAGE**  
 M.B. Vict., M.R.C.P.

CHIEF CLINICAL ASSISTANT AND REGISTRAR, DEPARTMENT FOR  
 NERVOUS DISEASES, GUY'S HOSPITAL

**J. W. ALDREN TURNER**  
 M.A., D.M. Oxfd, F.R.C.P.

NEUROLOGIST, ST. BARTHOLOMEW'S HOSPITAL, LONDON

A SYNDROME comprising pain and flaccid paralysis of the muscles round the shoulder girdle occurred fairly often during the war years 1941-45, though previously it had been rare. We observed 136 cases during neurological work in the Army in the United Kingdom and in India Command.

The essential clinical picture is simple: without any constitutional disturbance pain starts suddenly across the top of the shoulder-blade and may radiate down the outer side of the upper arm or into the neck. This pain lasts from a few hours to a fortnight or more, and then a flaccid paralysis of some of the muscles of the shoulder girdle and often of the arm develops, and in some cases there is a patch of numbness over the outer side of the upper arm. When the paralysis appears, the severe pain usually stops, but a dull ache may persist considerably longer. This clinical picture is subject to modifications.

Remarkably little was published about this condition before 1942. Some cases of serratus-magnus palsy developing after operations or after infections are recorded (Bramwell and Struthers 1903), but most of the serratus-magnus palsies were traumatic in origin. The standard neurological textbooks (Gowers 1892, Allbutt and Rolleston 1910, Oppenheim 1911, Harris 1926, Kinnier Wilson 1940) do not describe the condition beyond stating that a toxic neuritis of the long thoracic nerve, and sometimes of the circumflex nerve, may occur after infections such as typhoid and pneumonia, Russell Brain (1940), under the heading "spinal neuritis," describes the condition as it affects the fifth and sixth cervical nerves, and ascribes it to an interstitial neuritis at the intervertebral foramina.

In England Richardson (1942) drew attention to the increased incidence of cases of serratus-magnus palsy, and of the 9 cases which he described only 1 could be ascribed to trauma, 1 followed pneumonia, and 1 glandular fever, and in 2 of the cases there was paresis of muscles of the shoulder girdle besides the serratus magnus. Richardson's cases are in our opinion similar to those recorded here. Shortly afterwards, in the Middle East, Burnard and Fox (1942) described cases of "multiple neuritis of the shoulder girdle" of similar type, and Spillane (1943) analysed 46 cases of "localised neuritis of the shoulder girdle." An official G.H.Q., M.E.F. pamphlet (1943) described the condition under the name "infective neuritis," but included under this heading also cases of nerve lesions of the lower limb, which appear to us to differ from shoulder-girdle paralysis. In the United Kingdom one of us (Turner 1944) described, under the name "acute brachial radiculitis," 36 cases, which are included in the present series. The following case illustrates the clinical course.

An officer, aged 48, had a mastoid operation on Aug. 16, 1944, and eight days later, while in bed in hospital, had sudden severe pain across the top of the right shoulder-blade and down the outer side of the right arm to the elbow. This pain lasted about twenty-four hours and then stopped. Two days later he noted weakness of his right shoulder and numbness over the right side of the neck and outer side of the right arm. There were no constitutional symptoms at the onset of the pain or the paralysis.

During the next two months the power of the right shoulder gradually improved. He was examined by one of us three months after the onset, when he had moderate wasting and weakness of the right lower trapezius, spinati, deltoid, biceps, and supinator longus, and there was winging of the right scapula due to partial paralysis of the serratus magnus. The right biceps and supinator jerks were feeble, the other reflexes normal. There was cutaneous sensory impairment over C4 and C5 spinal segments on the right.

**ANALYSIS OF THE CASES**

The 136 patients included 3 civilians and 1 Service-woman. There were 2 Indian sepoy in the series, and other cases have also been seen in Indians, but sufficient details of these are not available for them to be included; the occurrence of the condition in Indians is interesting, for poliomyelitis is very rare in the adult Indian though common among European troops in India and among Indian children.

The age-incidence was as follows:

Age (yr.)	14-18	19-24	25-29	30-34	35-39	40-44	45-49	50-54
No. of cases	2	38	41	26	21	5	2	1

The youngest patient was a boy of 15, who developed the condition after pneumonia, and the oldest was aged 54. These figures for age-incidence reflect fairly accurately the age-groups in the Services and are probably of little significance.

The countries in which the patients were serving when the disease started were as follows:

Country	No. of cases	Country	No. of cases
United Kingdom	49	At sea	2
India	47	Belgium	1
Burma	18	Borneo	1
Italy	6	China	1
M.E.F.	4	Iceland	1
North Africa	3	South Africa	1
East Africa	3		

The preponderance of cases in the United Kingdom and in the India-Burma theatre was to be expected because we were working in these areas. The papers previously mentioned show that the condition was also common in the Middle East, and it is clear that the disease was very widely distributed at any rate in the Eastern hemisphere.

**PRECIPITATING CAUSES**

A remarkable fact is that no less than 66 of the 136 patients were in hospital with other conditions when the shoulder-girdle syndrome started, and others had recently recovered from illnesses. In 98 of the cases there was evidence of some precipitating factor:

Precipitating Cause	Cases	Precipitating Cause	Cases
Operations	12	Infections	71
Herniotomy	8	Malaria	16
Appendectomy	1	Typhus and malaria	5
Varicocele	1	Typhus	4
Pilonidal cyst	1	Typhoid	1
Mastoid	1	Dysentery	5
Trauma	10	Smallpox	1
Gunshot wound of remote parts	5	Glandular fever	1
Minor local trauma	5	Rheumatic fever	1
Other conditions	5	Chest infections	9
Lumbar puncture	1	Septic infections	9
Air encephalogram	1	Minor fevers	11
Antisyphilitic treatment	2	Poliomyelitis	2
Severe exposure	1	Diphtheritic polyneuritis	6

**Operations**

All the above-mentioned operations were relatively minor, and different anaesthetics were given—some inhalational, some intravenous, and some spinal. No patient had received trichlorethylene in a closed circuit, which is known to injure the nervous system (Humphrey and McClelland 1944). In no case could the neurological condition have been due to a mechanical cause, such as pressure, for there was always a clear interval between the operation and the first symptom of the shoulder-girdle syndrome—pain. The intervals were three days

(4 cases); four days (1 case); six days (1 case); seven days (2-cases); eight days (1 case); ten days (1 case); twelve days (1 case); and fourteen days (1 case).

**Infections**

The preceding infections listed above were varied, and the pain almost always started in the convalescent stage of the illness—very rarely during the acute stage. The chest infections were pneumonia in 4 cases, acute bronchitis in 4, and a pleural effusion in 1. The septic infections were an axillary abscess in 4 cases, cellulitis in 4, and pyelitis and otitis media in 1 each. The cases described as minor fevers were probably of mixed aetiology and were of the types commonly diagnosed as influenza in Europe and as dengue or sandfly fever in India. The important point about them is that they preceded the shoulder-girdle syndrome and did not accompany its development.

The onset of the syndrome during an attack of post-diphtheritic polyneuritis is of interest. All these cases were seen in India, where diphtheritic polyneuritis, often secondary to cutaneous diphtheria, has been common. In all 6 the shoulder symptoms developed suddenly during recovery from a typical generalised polyneuritis.

The coincidence of anterior poliomyelitis and the shoulder-girdle syndrome may cause difficulty in diagnosis, but it seems the only reasonable explanation of the following case :

An R.A.F. corporal, aged 23, on Sept. 1, 1945, in India, had pains in the head and neck, moderate pain in the buttocks and back of the thighs, and general malaise. On Sept. 4 there was weakness of the legs and abdominal muscles, which progressed for about forty-eight hours, and he developed retention of urine. Admitted to a neurological centre on Sept. 5, he was found to have extensive flaccid paralysis of both legs and weakness of the lower abdominal muscles; the knee and ankle jerks were absent. There was no weakness of the arms. His cerebrospinal fluid (C.S.F.) contained 19 lymphocytes per c.mm. and 80 mg. of protein per 100 ml. Poliomyelitis was diagnosed.

On Sept. 14 he developed in both shoulders a burning pain which radiated down the outer side of the arms to the wrists. It differed from the aching pain he had previously had in the legs. This pain in the arms lasted about three weeks, gradually diminishing. Three days after it started he noted weakness of both shoulders, more on the right than on the left, and numbness on the outer side of both upper arms. Examination then showed gross weakness of the right deltoid and spinati and moderate weakness of the left triceps and infraspinatus; there was superficial sensory impairment in the distribution of both circumflex nerves; the left triceps jerk was reduced, but the other arm-jerks were normal; and there was no change in the condition of his legs.

During the next two months there was almost complete recovery of power and sensation in the arms, but only slight improvement of power in the legs.

**Trauma**

In 5 cases the patients had had minor gunshot wounds of other parts of the body some weeks previously and were under treatment for these when the shoulder-girdle symptoms started; 5 others had had trivial injuries of the neck or shoulder a week or so before the onset of the shoulder-girdle syndrome. In none of these cases was there a fracture, and in all of them any local pain due to the injury had stopped completely some days before the pain of the shoulder-girdle syndrome started. For these reasons the subsequent muscle paralysis cannot have been the direct result of the trauma.

**Other Possible Precipitants**

In the cases which followed lumbar puncture (for a prolapsed lumbosacral intervertebral disc) and air encephalography (for a suspected cerebral neoplasm) the 2 patients both developed severe pain in one shoulder, followed rapidly by a serratus-magnus palsy three or four days after the diagnostic procedure. The 2 men

having antisyphilitic treatment were receiving the standard-course of bismuth and nearsphenamine.

**Inoculations**

Unfortunately, careful inquiry into recent vaccination and inoculations was made in only 67 cases of this series. Of these 67 patients, 11 had had inoculations during the four weeks preceding the onset of their shoulder-girdle symptoms; in 6 cases the inoculation had been within the previous fortnight. The types of inoculations were T.A.B., antitetanus toxoid, and antityphus (European). Cases apparently related to the administration of serum are discussed below.

One remarkable case was that of a man under treatment for non-specific urethritis who was given intravenous T.A.B. to cause protein shock. Two hours later he developed severe pain across the back of both shoulders, which lasted a few days. On the day after receiving the T.A.B. he developed a complete paralysis of the left serratus magnus.

**SYMPTOMS**

**Onset**

An important feature of the onset was the absence of pyrexial and constitutional symptoms; local pain was almost always the presenting symptom. Several patients were convalescent from serious illnesses, and so their general health was below normal, but the onset of the shoulder-girdle syndrome was never marked by general symptoms such as occur at the onset of anterior poliomyelitis.

**Pain**

This was the predominant early symptom: it usually came on suddenly, and often it was severe. In a minority of cases it grew worse for some hours, or even a day or two. Its commonest distribution was across the back of the scapula and the tip of the shoulder, and it often extended down the outer side of the arm as far as the elbow. In some cases it spread down the outer side of the forearm and into the side of the neck. There was no exact relation between the position of the pain and the distribution of the subsequent muscle paralysis; but, in general, pain radiating below the elbow was associated with involvement of the biceps or the triceps, and radiation into the neck was associated with involvement of the sternomastoid or trapezius. Most of the patients with bilateral muscle paralysis had also bilateral pain, but this was not invariable, and some of those with unilateral paralysis had bilateral pain in the early stages. In 2 typical cases there had been attacks of similar pain in the shoulder two or three weeks before the apparent onset; this pain had disappeared completely for a fortnight, but then recurred and was followed by muscle paralysis a few days later.

The pain was generally a constant severe ache, and in a few cases which we examined in the acute stage it was associated with considerable tenderness of the muscles. It was not aggravated by coughing or by sneezing; arm movements often accentuated it, but movements of the neck usually had little effect on it.

The ordinary sequence of events was for the severe pain to last from a few hours to a week or two and then to stop fairly suddenly as muscle paralysis appeared; a less severe pain might last considerably longer. Sometimes severe pain lasted days or even weeks after the muscle paralysis appeared.

The duration of moderate pain and the interval between the onset of pain and the appearance of muscle paralysis were as follows :

Interval between onset of pain and of paralysis	Cases	Total duration of moderate pain	Cases
Simultaneous ..	12	Under 24 hours ..	10
Under 24 hours ..	13	1-7 days ..	43
1-7 days ..	64	7-14 days ..	26
7-14 days ..	20	14-21 days ..	20
Over 14 days ..	15	3-6 weeks ..	20
Uncertain ..	12	Over 6 weeks ..	14



The cases where the interval between pain and paralysis was uncertain were mostly those of serratus-magnus palsy, the onset of which is sometimes not noticed by patients lying in bed, the weakness being observed only when they try to raise the affected arm above their head to pick some object off a shelf. In 2 cases there was no pain.

**Motor Involvement**

The most striking feature was the rapid development of muscle weakness after a variable period of pain. The weakness was usually maximal at the onset, but in at least 16 cases it gradually increased for two or three days, and in 2 cases it progressed for seven days. Abatement of the severe pain as the weakness appeared was often noted. The weakness was of lower-motor-neurone type, with flaccidity of the affected muscles, and often rapid wasting; fasciculation was never seen. In the bilateral cases there might be an interval between the involvement of the two sides.

The way in which the muscles were involved shows that in many cases the pathological process was in one or more peripheral nerves, while in others it must have been in the nerve-roots. But in some cases a lesion in the spinal cord must be assumed.

**Peripheral-nerve Involvement**

*Single peripheral nerves.*—Involvement of the long thoracic nerve, leading to paralysis of the serratus magnus and winging of the scapula, was the commonest. There were 30 cases of unilateral involvement, of which only 3 were left-sided, and 2 cases with bilateral involvement of the long thoracic nerves; in these cases no other muscles were affected. There were also 11 cases with paralysis of the serratus magnus on one side and of other muscles on the opposite side. The occurrence of these latter cases of isolated serratus-magnus palsies, preceded by pain on one side and a more extensive muscle involvement on the opposite side, justifies including in the syndrome cases of isolated non-traumatic serratus-magnus palsies without other muscle involvement.

In 4 cases there was unilateral involvement of the suprascapular nerve, with weakness and wasting of the spinati; and in 4 other cases there was paralysis of the spinati on one side and involvement of other muscles on the opposite side. A notable feature in some of these was the different degree of involvement of the two spinati; usually the infraspinatus was the more severely affected, but in 1 case there were gross weakness and wasting of the suprascapular, with minimal involvement of the infraspinatus.

In 9 cases there was unilateral involvement of the circumflex nerve, with paralysis of the deltoid and a small area of sensory impairment of the outer side of the upper arm; and there was 1 case of isolated involvement of the musculocutaneous nerve, with paralysis of the biceps and sensory impairment in the distribution of the lateral cutaneous nerve of the forearm.

*Multiple peripheral nerves.*—In 57 cases the muscle involvement could theoretically be explained by a lesion affecting two or more peripheral nerves. The commonest combination was paralysis of the spinati and deltoid, usually with sensory impairment in the distribution of the circumflex nerve. In some cases implication of at least five or six nerves supplying muscles round the shoulder girdles would have to be assumed to account for the muscle involvement, and this points to a spinal-cord lesion.

**Nerve-root Involvement**

In 13 cases the involvement on one side was explicable by a lesion of the anterior and posterior roots, though in 3 of these there was an isolated serratus-magnus palsy on the opposite side. The common roots to be affected were C5 and C6, with weakness of the spinati, deltoid,

biceps, supinator longus, and at times the clavicular head of the pectoralis major; impairment of the biceps and supinator jerks; and sensory impairment over a strip on the outer side of the arm and forearm. In 5 of the cases C7 root was also involved, with some weakness of the triceps and wrist extensors and a depressed triceps-jerk.

**Spinal-cord Involvement**

In 21 cases it was impossible to explain the muscle involvement in terms of a peripheral lesion: there was patchy muscle wasting and weakness which did not correspond to the distribution of any combination of peripheral nerves or nerve-roots. In some of these cases, besides a spinal-cord lesion, one or more peripheral nerves may have been involved: it is difficult, for example, to picture a paralysis of the deltoid, with sensory impairment over a small area on the outer side of the upper arm, in terms of cord involvement.

Other evidence of spinal-cord involvement was found in 1 otherwise typical case examined two months after the onset, when the patient had wasting and weakness of the left infraspinatus, deltoid, and serratus magnus, without sensory impairment, and absent superficial abdominal reflexes, very brisk knee and ankle jerks, and bilateral extensor plantar responses. There were no symptoms referable to the legs or the sphincters, and the disturbance of pyramidal-tract function may not have been related to the shoulder-girdle weakness.

The following is the case-record of a particularly severe bilateral case in which the spinal cord was probably involved:

A sergeant, aged 39, was on a troopship off the West African coast, when he developed severe pain in his left upper arm; this became gradually worse in three or four days and radiated down the outer side of the arm. Six or seven days after the pain started he noted weakness of the left shoulder and arm and numbness of the outer side of the left forearm and thumb. There were no constitutional symptoms. The pain persisted and spread across the back of the shoulder-blades to the right shoulder and down the outer side of the right arm. About a week later he noted weakness of the right shoulder and arm and numbness over the right thumb. As weakness developed, the pain became much less severe. Three months later improvement in power started. Lumbar puncture five weeks after the onset showed no abnormality; the blood Kahn was negative; and radiography of the cervical spine was normal.

On evacuation to a military hospital in England six months after the onset his muscle chart (Medical Research Council annotation) was:

	Right	Left		Right	Left
Trapezius ..	5	4	Extensor communis		
Serratus magnus ..	5	5	digitorum ..	5	0
Pectoralis major ..	5	5	Extensor carpi ulnaris	5	0
Supraspinatus ..	2	4	Extensor pollicis longus	5	0
Infraspinatus ..	0	3	Extensor pollicis brevis	4	0
Latissimus dorsi ..	5	3	Pronator teres ..	5	3
Deltoid ..	0	4	Flexor carpi radialis ..	0	0
Biceps ..	4	1	Flexor pollicis longus ..	4	0
Brachialis ..	3	1	Flexor digitorum sub-		
Triceps ..	2	3	limis ..	4	5
Supinator longus ..	5	0	Flexor digitorum pro-		
Supinator brevis ..	5	0	fundus ..	5	5
Extensor carpi			Abductor pollicis brevis	2	5
radialis ..	5	0			

The other muscles were of normal power. Muscle wasting corresponded with the weakness; the arm-jerks were absent; and there was a small area of sensory impairment to cotton-wool and pinprick over the outer side of the forearm and over the thumb on both sides. There were no other abnormal neurological signs.

Though in this case there was considerable involvement of the muscles of the forearm besides the shoulder girdle, the history and physical findings are comparable to those in the more localised cases, and it appears to us to be of similar nature. It seems impossible to explain the muscle involvement by a peripheral lesion.

*Involvement of Thumb and Index Finger*

In most cases weakness was confined to the muscles of the shoulder girdle and upper arm, with occasional involvement of the forearm muscles, but in 5 there was profound weakness of the flexor pollicis longus and of the head of the flexor profundus digitorum to the index finger besides shoulder-girdle weakness :

The first case was seen 12 months after the onset with gross wasting and weakness of the right serratus magnus and left infraspinatus, and the patient said that at the onset he had been unable to flex his right thumb, but this had recovered in a few months.

In the second case the patient had had a typical attack with involvement of the right deltoid and spinati, and three months later had suddenly developed weakness of the right thumb and index finger. On examination there was no voluntary power in the right flexor pollicis longus and in the head of the flexor profundus digitorum to the index finger, and there was slight impairment of sensation over the front and back of the middle finger.

In 2 further cases there was weakness of flexion of the thumb and of the terminal phalanx of the index finger at the same time as the shoulder-girdle weakness.

The fifth case was unusual in that there were three separate attacks : in the first, shoulder-girdle weakness was accompanied by inability to flex the terminal phalanx of the right index finger, and in the third there was involvement of the flexor pollicis longus on both sides and of the flexor profundus to the index finger on the left side besides a recurrence of shoulder-girdle weakness.

A 6th case was seen in which there was no weakness of the shoulder-girdle muscles but sudden inability to flex the terminal phalanges of the left thumb and index finger following pain across the left shoulder and down the outer side of the arm and forearm. On examination there was no voluntary power in the flexor pollicis longus and in the head of the flexor profundus to the index finger, and there was loss of faradic excitability in these muscles. Possibly this was a case of poliomyelitis, but at no time was there any constitutional disturbance.

This localised paralysis cannot anatomically be of peripheral-nerve or nerve-root distribution and is only explicable by an anterior-horn-cell lesion. The occurrence of this type of case associated with otherwise typical examples of the shoulder-girdle syndrome is further evidence that in some cases the lesion was in the spinal cord.

*Sensory Changes*

In 58 cases there were objective sensory changes on examination. A considerable number of our patients were seen first by us many weeks or months after the acute attack, and some of them gave a history of localised numbness in the early stages, even when there was no residual sensory impairment at the time of examination ; so alteration of sensation at the onset was probably commoner than our figures suggest. The sensory impairment was usually slight and affected all forms of cutaneous sensibility ; no abnormalities of proprioceptive sensation were observed. The commonest area of sensory impairment was a small strip over the outer side of the upper arm, corresponding to the distribution of the circumflex nerve ; this was found in 42 cases. In the great majority of these the deltoid was paralysed, but in two or three there was circumflex sensory impairment with minimal weakness of the deltoid.

In the cases with radicular distribution of muscle weakness there was always sensory change, down the outer side of the area and forearm in the C5-6 cases, and extending to the side of the neck when C4 root was involved.

In the cases where we have considered a spinal-cord lesion to be probable, sensory impairment was inconstant and often absent. Sensory change in the circumflex-nerve distribution was found in some of them, which suggests peripheral-nerve involvement in addition to a cord lesion.

SPECIAL INVESTIGATIONS

As a high proportion of the cases were seen some considerable time after the onset, observations on the C.S.F. in the acute stage are relatively few. However, 14 had a lumbar puncture within four weeks of the onset, and 3 within three days, and in all but 1 the cell and protein contents of the C.S.F. were normal.

The exception was a man with glandular fever who developed typical shoulder-girdle symptoms towards the end of the second week of his illness. A week after the shoulder-girdle palsy developed the C.S.F. showed 10 lymphocytes per c.mm. and a protein content of 50 mg. per 100 ml. The significance of this slight increase of lymphocytes is uncertain, as it may occur in cases of glandular fever without manifest neurological involvement.

The cervical spine and shoulder joints were radiographed in some cases and showed no abnormality. Electrical reactions of the affected muscles showed reaction of degeneration after three weeks in the more severe cases and, as in other lesions of the lower motor neurone, were of some value in prognosis but little in diagnosis. Weddell et al. (1944) found fibrillation action potentials on electromyography in a few cases tested when the wasting was severe.

BILATERAL CASES

In 39 of 136 cases muscles on both sides were affected. The intervals between the onset of symptoms on the two sides were :

Period	No. of cases
Simultaneous or within a few hours	22
1-7 days	2
8-14 days	3
2-6 weeks	3
3 months	1
6 months	1
Uncertain	5

In one of these cases pain started at the same time on both sides, but there was a week's interval between the development of paralysis on the two sides. The cases noted as "uncertain" were in patients who had not noted any weakness on one side but were found to have involvement of either the serratus magnus or the spinati which had not given rise to symptoms.

There was usually asymmetrical involvement of the two sides ; in some cases only one peripheral nerve was affected on one side, while on the other side there was a radicular lesion or involvement of several peripheral nerves. The degree and extent of muscular weakness often varied considerably on the two sides. In a few cases the initial pain was unilateral and the subsequent paralysis bilateral ; and the reverse also occurred—bilateral pain in the early stages and muscle involvement on one side only.

RECURRENCE

Recurrent attacks affecting the same shoulder were uncommon ; though it is possible to regard the bilateral cases where there was an interval between the involvement of the two sides as having two separate attacks. Dixon and Dick (1945), in a study of 16 cases, remark that second attacks are "extremely common," but that seems to be referring to bilateral cases of this type.

There was, however, one patient whom we examined during his third attack.

In 1935, at the age of 19, after several weeks' severe pain across the back of the shoulders and down the outer side of both arms, he developed weakness and wasting of the muscles round the right shoulder and upper arm, and difficulty in flexing the tip of his right index finger. After the condition had remained stationary some months it began to improve, and in about four years there was no disability except inability to flex the last phalanx of his right index finger.

In March, 1944, after pain in the right shoulder for a month he had renewal of weakness of the right shoulder and difficulty

in raising the arm above his head. This persisted for several weeks, and normal power had returned within six months.

The third attack started in India in August, 1944, after a boil near the right elbow; this was followed by pain down the outer side of the right arm and forearm. The pain lasted about a month, when it eased off and was replaced by weakness of the right shoulder and elbow and difficulty in flexing the terminal phalanges of both thumbs and the left index finger; there was also a small patch of numbness over the outer side of the upper arm. On examination there were extensive wasting and weakness of the muscles of the right shoulder girdle and upper arm, with paralysis of the flexor pollicis longus and the head of the flexor profundus digitorum to the index finger both right and left, and sensory impairment in the distribution of the right circumflex nerve. During the five months we had him under treatment there was gradual slow improvement in muscle power.

#### CASES WITH OTHER NEUROLOGICAL INVOLVEMENT

One case with evidence of pyramidal-tract involvement has already been mentioned. Another patient developed typical subacute combined degeneration of the spinal cord a year after an attack of the shoulder-girdle syndrome, which had affected the right circumflex nerve. The shoulder-girdle weakness was recovering well when the combined degeneration first gave rise to symptoms, and it seems unlikely that the two conditions were related. A further patient, some weeks after the development of his shoulder-girdle weakness, developed a partial left ulnar palsy and a right external popliteal palsy.

#### TREATMENT AND PROGNOSIS

No specific treatment for the condition is known, and treatment similar to that used for poliomyelitis was given. In the early painful stages analgesics may be necessary; and, when weakness appeared, we usually applied abduction splints when the deltoid was involved. The most important form of physical treatment was to put the shoulder joint through its full range of movements at least twice a day to prevent stiffness, and to start graduated active movements as soon as any voluntary power returned. In the cases where reaction of degeneration developed we used galvanism to maintain the muscle bulk (Gutmann and Guttmann 1944). Where normal electrical reactions are present three weeks after the muscle weakness has come on, electrical treatment is unnecessary.

Our patients were seen at various intervals after the acute attack, were under treatment for periods from a few days to several months, and were then either invalidated, evacuated from India Command, or returned to units in lowered medical categories, and for most of them it is impossible to give reliable information about the ultimate recovery of function.

The prognosis of cases seen in the early stages is as difficult as in anterior poliomyelitis, and very similar principles apply. Muscles not completely paralysed during the acute attack, or muscles showing some return of voluntary power during the first three or four weeks, will usually recover completely in six months or less. When severe wasting occurs early and rapidly, the prospect of useful power returning is poor. Recovery of voluntary power in completely paralysed muscles can certainly start nine to twelve months after the onset and probably even later, and can continue up to two years or possibly longer. The muscle which, in our experience, is least likely to recover is the serratus magnus, where return of power after complete paralysis was poor; but with isolated palsies of this muscle reasonably good functional results were obtained by the use of other muscles.

Dixon and Dick (1945) followed up 16 cases for two years, and state that by the end of one or two years all but 2 of their cases had shown very marked improvement. They state that recovery may begin as late as five or six months after the onset.

#### DIFFERENTIAL DIAGNOSIS

*Anterior Poliomyelitis.*—When cases are seen long after the acute phase they may be mistaken for old cases of anterior poliomyelitis; but in the early stages of the shoulder-girdle syndrome constitutional symptoms are absent and the C.S.F. normal and in many there are mild sensory changes. Paul et al. (1944) tried to isolate poliomyelitis virus from the faeces of 6 cases of the syndrome but were unsuccessful, whereas they obtained the virus from 9 out of 15 cases of poliomyelitis.

*Prolapsed Cervical Intervertebral Disc.*—Owing to the transverse course of the roots in the cervical spine, lateral prolapse of a disc usually affects only one root—most often C7. The symptoms have been described by Spurling and Scoville (1944) and Elliott and Kremer (1945). The essential feature is pain down the outer side of the arm, lasting some weeks, and dysaesthesia in the index finger; though slight wasting and weakness of the triceps are common, the profound weakness and atrophy of the shoulder-girdle syndrome do not occur.

The muscle involvement in our cases is explicable in terms of one or more peripheral nerves, two or more spinal roots, or diffuse spinal-cord involvement, which cannot be explained by compression from a laterally prolapsed intervertebral disc. A more centrally placed disc prolapse causes spinal compression and usually a progressive condition, again unlike the clinical picture in our cases.

*Brachial Neuritis.*—This diagnosis includes several conditions, and the syndrome of the prolapsed cervical disc has only recently been separated from it. Used in its strict sense it implies a diffuse affection of the brachial plexus, leading to pain in the arm, slight generalised weakness, diminution of the tendon-jerks, and diffuse sensory changes. Localised paralysis and wasting of muscles, are not features of brachial neuritis.

*Progressive Muscular Atrophy.*—Several cases were referred to us with this diagnosis, but there should rarely be difficulty in distinguishing them. The acute onset with pain, the rapid development of wasting, the absence of fasciculation, and the non-progressive course of the disease are all entirely different from progressive muscular atrophy; and sensory changes are often found in the shoulder-girdle syndrome.

#### ETIOLOGY

This remains obscure. A virus infection has been suggested as the cause, but there are features unusual with virus infections of the nervous system, particularly the absence of constitutional symptoms at the onset, and the normal C.S.F.

A similar condition has been known for many years as an occasional complication of injection of serum (Thaon 1910, Kennedy 1929, Young 1932, Smith 1939, Thompson and Tombleson 1940). This usually develops from seven to ten days after the serum has been given and may be preceded by generalised urticaria. The serum cases have severe pain across the shoulder and upper arm, which lasts several days and is replaced by an atrophic palsy, usually affecting the muscles supplied by C5 and C6 roots, but sometimes only the serratus magnus or deltoid. We have seen 3 serum cases during the same period as the 136 cases of this series.

One man developed a deltoid palsy, preceded by severe pain ten days after diphtheria antitoxin, and another man developed paralysis of the deltoid and spinati ten days afterwards; in neither of these cases was there urticaria. The third patient developed severe generalised urticaria about ten days after antitetanus serum and anti-gas-gangrene serum; and, as this subsided, he noted weakness of both arms. Recovery started ten days later; and when he was examined two months after the onset there was moderate weakness of the left trapezius but no other abnormal signs.

The pathology of these cases is not fully understood; they are attributed to perineural oedema of the affected roots or nerves, comparable to the urticaria of serum sickness. Hughes (1944) has suggested, without any direct evidence, that they are due to a virus infection, the organism being introduced at the injection of the serum.

There is complete clinical similarity between the serum cases and the type of case described in this paper, and it is reasonable to assume that they are of similar aetiology.

There were no deaths in our series, and, in view of the recovery to be expected, biopsies of affected nerves were considered unjustifiable. It is doubtful if any comparable condition occurs in the lower limb; isolated external popliteal-nerve lesions are common, but many of these are pressure palsies, and in the cases where there is no evidence of pressure there has rarely been any pain.

#### NOMENCLATURE

None of the names applied to this condition are satisfactory, and most of them are inaccurate: infective neuritis, localised neuritis of the shoulder girdle, and acute brachial radiculitis all imply an infective origin, which is uncertain, and suggest that the disease is limited to either peripheral nerves or nerve-roots. A more general name seems preferable, and we suggest that until the pathology and aetiology are known it should be called "neuralgic amyotrophy."

#### SUMMARY

A syndrome consisting in severe pain across the shoulder and upper arm, followed by atrophic paralysis of muscles round the shoulder girdle, is described.

On clinical grounds it is thought that the pathological process can involve one or more peripheral nerves, two or more spinal roots, or the spinal cord.

The condition appears to be a distinct clinical entity which became increasingly common during the war years.

A similar syndrome may occur some days after the injection of serum, and the two conditions are probably identical, though the aetiology is unknown.

The name "neuralgic amyotrophy" is suggested.

Our thanks are due to the late Dr. George Riddoch, to Dr. Hugh Garland, and to Dr. P. S. Buckley, with whom we often discussed the condition, and to the many medical officers who referred cases to us.

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## VACCINATION AGAINST INFLUENZA A

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MANY attempts to use formalised virus vaccines for protective inoculation against influenza have been made since the first trials in 1937 with virus contained in mouse-lung filtrates (Stuart-Harris et al. 1938). The possibility of using much more potent preparations arose from the discovery of Nigg and her colleagues (1940) and Burnet (1941) that virus could be obtained in very high titre in the allantoic fluids of infected eggs. Later Francis and Salk (1942) described a method of concentrating and purifying such vaccines by adsorption on, and elution from, chicken red cells; and Stanley (1944) and his co-workers developed a method of achieving the same end by differential centrifugation.

Vaccines thus improved have been used very extensively in the American Army. Controlled trials with concentrated vaccine (mixed A and B) have given very encouraging results in the U.S.A. Thus, against influenza A in 1943 (Commission on Influenza, 1944) a reduction in incidence to about a fourth was achieved in five of six centres; at the sixth, in California (cf. Eaton and Meiklejohn 1945), the reduction was doubtfully significant. Even better protection against influenza B is suggested by the reports of Francis et al. (1946) and Hirst et al. (1947); the incidence of influenza B in inoculees was 11% and 5% of that in uninoculated groups. Hitherto, trials in this country have been unsatisfactory because, in the communities under observation, an influenza outbreak with a high incidence has not appeared within a reasonable time. In two groups under observation in 1946, however (Dudgeon et al. 1946), an apparent reduction in incidence of influenza B to a fifth and a half was achieved by vaccination. These groups were the only ones with a fairly high incidence of infection; in other groups, with a low incidence, little if any benefit from inoculation was demonstrable.

#### PLAN OF INVESTIGATION

An attempt was made during the winter of 1946-47 to test further the value of influenza vaccination in Britain. The vaccine used was made from infected allantoic fluids inactivated with 1:2000 formalin and concentrated by Francis and Salk's (1942) method.

Most of that used was made by the Commonwealth Serum Laboratories, Melbourne (virus A, Melbourne strain), but some was prepared by the South African Institute for Medical Research, Johannesburg (A, P.R.8 strain), and some by the Connaught Laboratories, Toronto (P.R.8 strain). Though the vaccines had been kept in the cold ( $-1^{\circ}\text{C}$ ) for over a year, all batches were still potent as judged by Salk's modification of the Hirst test, fowl red cells being usually agglutinated to a titre of 1:2048. All of that used in the Army and school trials was made from Melbourne virus.

The vaccine was tested by measuring the antibody response to a subcutaneous injection of 1 ml. in 46 adult volunteers; these people were bled at the time of vaccination and again two weeks later. The rise in antibodies was measured by means of Salk's modification (1944) of Hirst's test, and using an antigen made from the P.R.8 strain of virus. The results are shown in fig. 1. If a fourfold rise in antibodies is taken as a positive result, 38 persons (83%) gave a positive response to the injection; the average rise was over sixfold. In 6 of the 8 negative results the original antibody level was fairly high; it has been previously observed by

other workers that under these conditions there is often no further rise as a response to injection or to a clinical attack of the disease. From the above results we concluded that the vaccine was suitable for a clinical trial.

#### SCOPE OF THE TRIAL

Epidemiologists are familiar with the idea that vaccination of part of a community may, by reducing chances of spread of infection, lead to a lowered incidence of disease even in the unvaccinated members of the group. Salk and colleagues (1945) have emphasised the likelihood of such a phenomenon in the case of influenza. In previous trials of vaccines we have used the strict alternate-case method to obtain controlled results. In the present investigation some trials were made in this way; in other trials whole groups were, so far as possible, vaccinated, and results in them contrasted with those in comparable uninoculated groups. We thus hoped to learn something of the liability to influenza of an immunised herd as well as that of an immunised individual. In nearly all our groups, however, the inoculated groups were able to mix with control groups during part of the day—during school-hours in the case of school-boys, in canteens in the case of Army recruits.

Prophylactic vaccination was carried out under controlled conditions during November and December, 1946, in 24 mental hospitals, 3 public schools, and numerous smaller communities, including 2 preparatory schools, nursing staffs of hospitals, and some patients of general practitioners. In 18 Army training centres alternate intakes were vaccinated, starting at some centres in November, 1946, and at others as late as Jan. 2, 1947. Altogether some 20,000 people were inoculated, there being about an equal number of uninoculated controls living under similar conditions. Unpleasant reactions to the inoculations, both general and local, were satisfactorily few.

#### INCIDENCE OF THE DISEASE

Conclusive results from all these sources were disappointingly small for several reasons, the most important being the mild clinical picture and the low incidence of the disease. Many cases of true influenza were undoubtedly missed in the Army, and probably a smaller number in the mental hospitals. A complete serological check of all controls either by hæmagglutination methods or complement-fixation tests would have been the only way to estimate the incidence more accurately, and this was not practicable. A considerable number of complement-fixation tests were done by Dr. A. J. H. Tomlinson, of the Central Public Health Laboratory, Colindale, on

samples of late convalescent serum from Army recruits known to have experienced an influenza-like disease early in 1947. These results provided laboratory evidence of the presence of influenza A in the units concerned.

The disease was mild and did not show its usual facility for rapid spread except in a few epidemics among school-children and in prisoner-of-war camps and Army training centres. The highest attack-rate in any Army training centre using the vaccine was 14.5% of controls; in one boys' school it was 22% of controls; but in seven mental hospitals only sporadic cases were reported and serologically confirmed. The experience of general practitioners interested in influenza leads us to suppose that the incidence in mental hospitals was not very dissimilar from that among the same age-groups in the general population. The incidence of influenza was so low among the smaller communities, such as the hospital nursing-staffs, that the results were not worth considering.

#### INFLUENZA IN BOARDING-SCHOOLS

Almost the only communities, apart from prisoner-of-war camps, to experience real epidemics were schools in the southern half of England. Epidemics occurred in two of the three boarding-schools using the vaccine, and through the kindness of Dr. W. H. Bradley, of the Ministry of Health, other schools were visited while epidemics were in progress.

The clinical picture of influenza in the winter of 1946-47 is best illustrated by some of the unvaccinated schools.

On Jan. 21 a girls' boarding-school was visited near the height of its epidemic. The 13 recently admitted patients all complained of headache, stuffy nose, sore throat, malaise, shivering, and a dry cough. Their temperatures averaged 102.5°F and pulse-rates 120 per min.; all had red injected throats, with, in some, hypertrophied lymph-nodes on the posterior pharyngeal wall. The course of the disease was typically short; the temperature remained high for only 24-36 hours, after which it fell rapidly to normal; but it sometimes rose to a second, smaller, spike one or two days later. Five days after the onset of symptoms most children were perfectly well. Influenza virus A was grown in fertile eggs from garglings taken on Jan. 21, and complement-fixation tests done on 8 convalescent sera all showed high (1:32 or 1:64) titres against influenza virus A (P.R.8). The over-all attack-rate in this school was 34%; it was a clear-cut epidemic uncomplicated by any other disease.

On Jan. 24 the onset of a clinically similar epidemic was seen in a large boys' school. The symptoms were identical, but the attack-rate—21%—was lower. Here also influenza virus A was grown from garglings, and blood samples gave positive Hirst test results. An attack-rate of 70% was encountered by Dr. A. M. MacFarlan in a school of 250 boys which he was investigating.

The largest vaccinated school to experience an epidemic consisted of 614 boys, of whom just over 400 were in one large house with eleven dormitories, and about 60 in each of three smaller, separate, houses. The dormitories contained all ages from 13 to 18 years. In the day-time the boys mingled for classes, meals, and games. In the large house alternate dormitories had been vaccinated, and in the smaller houses 2 out of 3 were inoculated as completely as possible on Dec. 12 and 13, 1946; it was impossible to vaccinate all the boys, since some parents refused permission. Altogether there were 305 vaccinated boys and 309 controls. The original intention was to compare the subsequent incidence of influenza in (1) immunised and unimmunised boys (alternate cases), and (2) immunised and unimmunised groups of boys (alternate groups). The school reassembled on Jan. 25 for the spring term. Next day 2 boys were admitted to the sanatorium with a diagnosis of influenza, and this was the beginning of an epidemic which reached

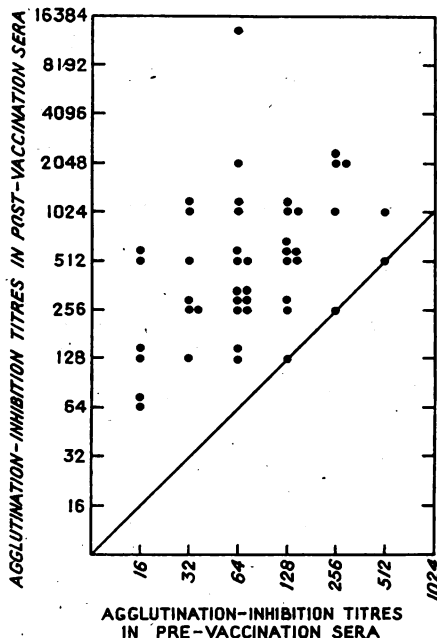


Fig. 1.—Influenza-A antibody-response to vaccination in 46 persons.

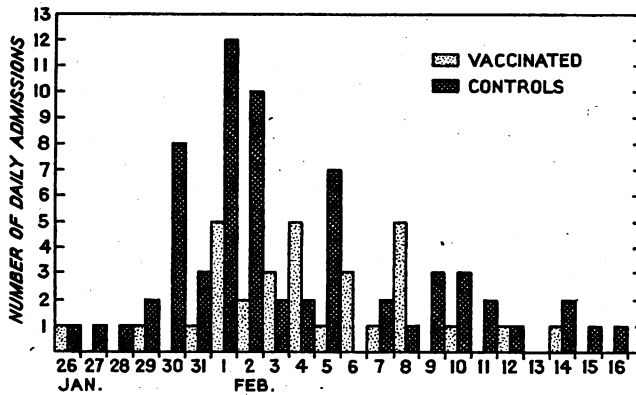


Fig. 2—Incidence of influenza and feverish colds during the spring term, 1947, in a school of 612 boys, of whom 305 had been vaccinated.

its peak on Feb. 2. Influenza virus A was again successfully grown in eggs. The clinical picture of this epidemic was not nearly so uniform as in the unvaccinated schools, about a third of the patients having no more than slight feverish colds with a temperature below 100°F; in the absence of an epidemic, these cases would not have been diagnosed as influenza. Fig. 2 shows the daily admissions of vaccinated and control boys for all cases, varying from slight feverish colds to typical influenza.

From this it can be seen that, during the epidemics, febrile upper respiratory infection was twice as common in the controls as in the vaccinated; when an attempt was made to count only those boys with typical influenza, the comparative incidence in the two groups seemed to be the same. The clinical attack-rate for all febrile upper respiratory infections was 22% among controls and 11% among the vaccinated. The curve of increased upper respiratory infections coincided with that of typical influenza; so probably most of the "feverish colds" were, in fact, mild influenza. Fig. 2 shows that initially the incidence of disease was much higher among the controls, but that after some days more cases occurred among the vaccinated; so the final advantage to the vaccinated was not very great.

Among boys in the control (uninoculated) dormitories and houses the attack-rate was 21.5%, or almost exactly the same as the rate among all uninoculated boys in the school (21%); the uninoculated boys living in separate houses did not appear any more susceptible to influenza than the total controls.

A complicating factor in this school was a coincident measles epidemic. Some of the boys in the prodromal stage of measles were at the same time harbouring the influenza virus, as was proved by recovering the virus from garglings in boys who three or four days later produced a typical measles rash. Any boy having prodromal symptoms for longer than five days, or who had a separate febrile upper respiratory infection later followed by a typical prodromal measles fever, was counted as having had influenza or a feverish cold for the purposes of this investigation. We could not investigate each case by taking garglings for cultivation in eggs. We did, however, obtain laboratory evidence from garglings that some of the mild cases in vaccinated boys were genuine influenza. We also had serological evidence that some of the controls had a very mild attack with a temperature of no more than 100°F.

The second partly inoculated school to experience an epidemic was one of 327 boys. Here more than half (206) had been vaccinated in December, 1946, in response to an unexpectedly high volunteer-rate among parents. The school reassembled on Jan. 17; and on Jan. 21 there were 2 cases of influenza. A small epidemic followed involving 23 (11%) of the vaccinated boys and 21 (17.3%) of the controls. These were in boys admitted to the sanatorium; there were also some very mild

feverish colds among boys treated in their "houses" and of whom no records were kept. For the rest of the term there were sporadic cases of an influenza-like disease, and of streptococcal tonsillitis, besides a few cases of measles.

There is little to suggest that the vaccine accounted for the mild type of disease in these schools, since many mild cases are known to have occurred in the Army; moreover, a rather similar state of affairs was seen in some other schools where no vaccine was used.

#### RESULTS IN THE ARMY

Between November, 1946, and February, 1947, the influenza vaccine was used in 18 Army training centres. These were chosen because the incidence of influenza is usually much higher in recruits than in seasoned troops. Alternate fortnightly intakes of recruits were vaccinated, beginning in some places with the intake of Nov. 22, 1946. Intakes varied in size between 100 and 450 men. Those in primary training centres remained in the barracks for 6 weeks of training before being posted elsewhere, and the others for 10–12 weeks. In all, 5000 inoculations were done and 4000 uninoculated men acted as controls. It was planned that medical officers should keep dated records of all upper respiratory infections among the men, both controls and vaccinated. No training centre had any epidemic of major proportions, but there was certainly a minor prevalence of mild influenza in many units in January and February, 1947. Assessment of results was difficult because influenza in 1947 was extremely mild and the distinction of influenza from other respiratory infections correspondingly difficult. Since this diagnosis was made by many different medical officers, there was obviously considerable variation in what was labelled clinical influenza and what was regarded as a cold or febrile catarrh. The success of these vaccination trials in the Army training centres depended on the presence of an easily recognisable clinical entity, true to type and affecting many units; this was unfortunately lacking. At several centres there were undoubted cases of influenza, later confirmed by serological tests; but only three units experienced definite outbreaks subsequent to vaccination.

In one of these centres (a training brigade of Royal Engineers at Cove, Aldershot) an outbreak in the second week of January, 1947, affected 15 of 101 uninoculated men of the Dec. 5 intake (see fig. 3). It did not spread to men of the next (Dec. 18) intake, though these were not inoculated until the outbreak was in full swing; but complement-fixation tests raised grave doubts about whether the outbreak was influenza or not.

In an Army training centre at Richmond, Yorkshire, there was little evidence of influenza among the intakes of Dec. 5 and Jan. 1. In the next intake, that of Jan. 16, which was an uninoculated group, 27 cases occurred among 186 men. Unfortunately the next, vaccinated, intake (Feb. 6) had 19 cases among 190 men. At Shrewsbury, in another Army training centre, influenza hit the middle two of four intakes: that of Jan. 16 (uninoculated) had 12 cases in 105 men, while that of Feb. 6 (vaccinated) had 15 in 106 men. Complement-fixation tests on convalescent sera from Richmond and Shrewsbury mostly showed high (over 1:32) titres; so probably these centres experienced true influenza outbreaks. Taking together the results from the two centres, the incidence of clinical influenza was, in 619 vaccinated men 7.1%, and in 651 controls 8.3%. Fig. 3 includes also for comparison results obtained in units at Canterbury and Cardiff. As will be noted, the trend of the results is much the same as elsewhere, but no detailed analysis was thought to be worth while, since numbers were considerably smaller.

It can be argued that no favourable result could be expected from vaccination after the beginning of

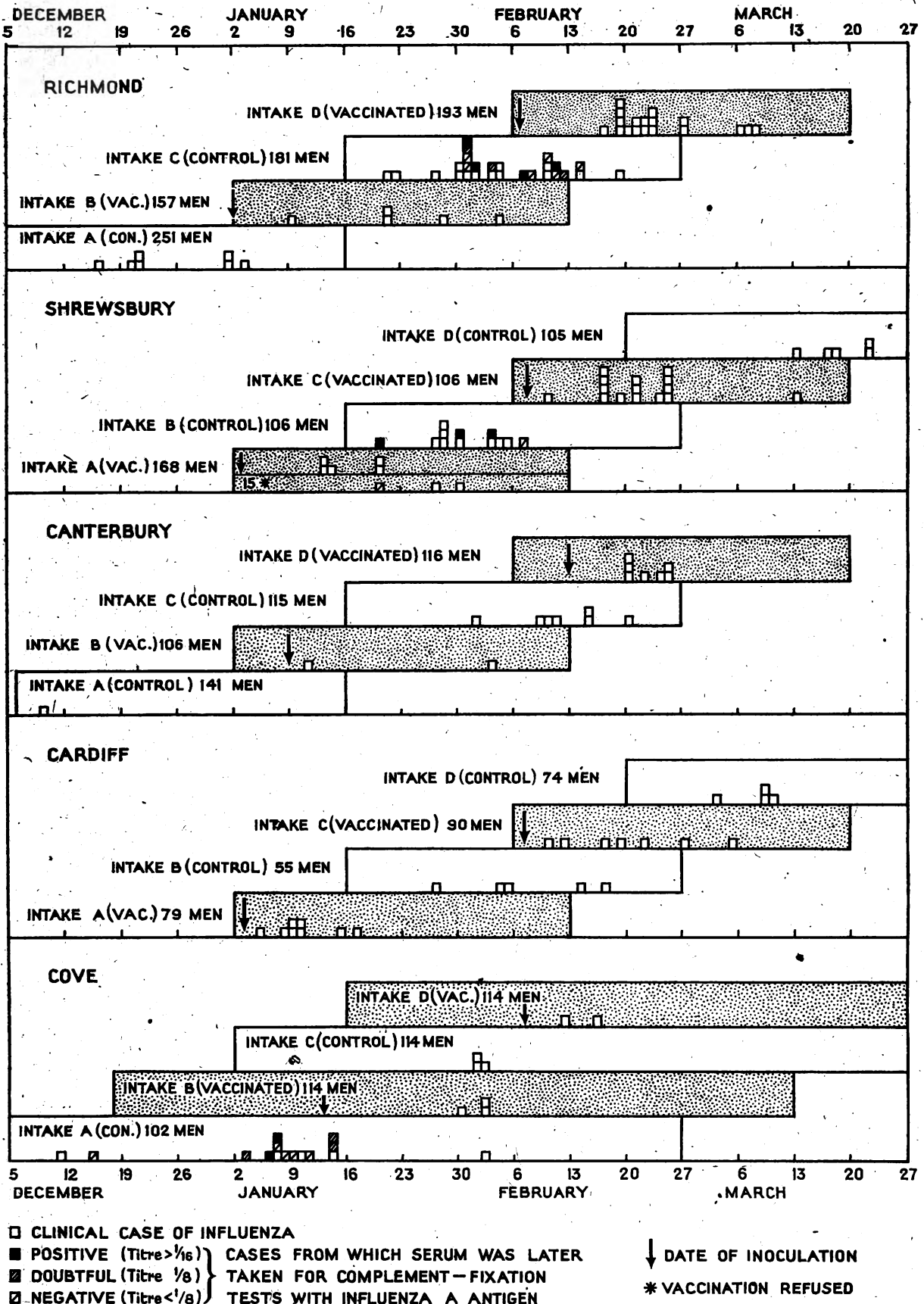


Fig. 3—Influenza at five Army training centres in the winter of 1946-47.

February, for by then the influenza wave in the country as a whole had passed its peak. Quite certainly, however, we could have obtained an apparently favourable but wholly fallacious result by excluding from consideration all the intakes of Feb. 2 and onwards; for among two vaccinated groups entering about that time the incidence was much the same as that among control groups entering in mid-January.

#### INFLUENZA IN MENTAL HOSPITALS

Of the 24 mental hospitals which used the vaccine, only 7 reported any cases of influenza; these were sporadic and far too few to help in assessing the effect of vaccination. Since in several instances the presence of the virus was confirmed either by cultivation in eggs or serologically among one or two patients in a ward, it is surprising that the disease did not spread.

The largest number of cases was that reported from a mental hospital in Surrey. Here among 1000 patients taking part in the investigation 32 cases of influenza were diagnosed clinically as having influenza; of these, 20 were among the 500 controls and 12 among 500 vaccinated persons. Serological evidence of infection with influenza virus A (Hirst test) was found in 8 out of 14 blood samples from controls; the virus was isolated from 1 vaccinated patient. The materials were kindly sent to us by Dr. G. A. Lilly.

#### DISCUSSION AND SUMMARY

In the autumn and winter of 1946-47 a formalised influenza-A vaccine was given to about 20,000 people; about an equal number living under the same conditions were designated as uninoculated controls.

In twenty-four mental hospitals and some small groups the incidence of influenza was so low that no conclusions about the efficacy of the vaccine could be drawn.

In two out of three schools in the trial there were outbreaks of influenza. In one the incidence in the vaccinated boys was 11% and in the controls 21%; in the second the incidence was 11% in the vaccinated, and 17.3% in the controls. The results in this second school were somewhat obscured by concurrent streptococcal tonsillitis.

In only three of eighteen Army training centres under study did an outbreak of upper respiratory disease take place after completion of the inoculations; and one of these was very doubtfully influenzal. In the other two the incidence of influenza was 7.1% in the vaccinated and 8.3% in the controls—not a significant difference. The only safe conclusion is that, in the absence of a widespread epidemic involving many units under observation, a trial on the lines described is unlikely to give a definite answer.

Our results show that, even in communities apparently favourable for vaccination, present-day vaccines have not produced any striking reduction in incidence. No conclusion can be drawn from this study about the merits of attempting to immunise whole communities, theoretically reasonable though this may be.

The results are much less encouraging than those reported in 1944 and 1946 from the United States; on the other hand, recent reports from there (Francis et al. 1947, Sigel et al. 1947) indicate that in 1947 vaccination had little, if any, effect on the incidence of influenza. Apparently the strains of virus A causing the 1947 epidemics were antigenically rather remote from those contained in the vaccine. Further studies, especially of antigenic relations among strains of influenza viruses, are necessary before general use of influenza vaccines can be advocated.

We wish to acknowledge the willing help of many medical officers in the Army; at schools, and at mental homes and

hospitals, and in particular Dr. W. H. Bradley and Dr. G. E. Godber, of the Ministry of Health; Brigadier E. A. Richmond, director of hygiene, War Office; Dr. G. F. Hawkins and Dr. C. H. Harley; and Dr. Robert Cruickshank and Dr. F. O. MacCallum, of the Central Public Health Laboratory, Colindale.

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## PRIMARY PULMONARY COCCIDIOIDOMYCOSIS

### CASE OF LABORATORY INFECTION IN ENGLAND

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THE occurrence of a case of primary pulmonary coccidioidomycosis in England is a medical curiosity, but in view of the dangers of laboratory infection it is considered that this case should be recorded.

Human infection with the organism *Coccidioides immitis* was first recorded at the end of the nineteenth century in South America and California in the form of a chronic and often fatal granuloma affecting the bones and other tissues. This was the only form of the disease recognised until Gifford (1935) and Dickson (1937) drew attention to the fact that, in the parts of California from which the patients with coccidioidal granulomata usually came, there was another endemic disease called San Joaquin Valley fever or "the bumps." This condition is characterised by an acute febrile respiratory infection associated with erythema nodosum, and by skin tests and sputum examination it was shown that this disease represented a primary pulmonary infection with the organism, which usually cleared, conferring immunity on the patient, and only very rarely went on to haematogenous dissemination and granuloma formation. These investigators also showed that many cases of respiratory infection without erythema nodosum were due to the same organism.

Our knowledge of the primary infection has been greatly increased during the recent war because, owing to the suitability of the climate in the affected areas for flying training and military exercises, many American servicemen lived in or passed through them. Skin-test investigations reported by Lee (1944) and Smith et al. (1946a) have indicated that subclinical infections are four times as common as clinical cases, and that the prognosis is good, dissemination occurring in 1 in 380 infections in white races, though the figure for negroes is 1 in 30.

The organism, when found in lesions in the body, appears as a spherule which produces endospores which in turn give rise to fresh spherules. If the endospores are expelled from the body they develop a mycelium and chlamydospores; this form is seen on culture and when the organism is growing on the ground in endemic areas. The chlamydospores are the source of fresh human infections, which are therefore more common when the chlamydospores are blown about in dry weather (Smith et al. 1946b).



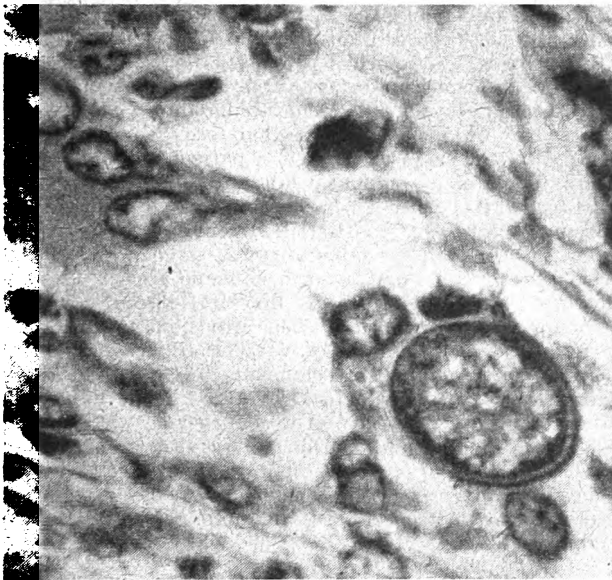


Fig. 1.—Section of lesion in guineapig liver, showing spherule. ( $\times 1200$ .)

Though Rosenthal and Routien (1946) have produced experimental infection in guineapigs by inhalation of endospores, these are generally regarded as non-infectious. For this reason and because chlamydospores are rarely found in the body, it is usually considered that case-to-case spread does not take place, though Barnes (1946) has recorded a case in which mycelium and chlamydospores were found in a chronic coccidioidal lung cavity removed by lobectomy.

#### CASE-RECORD

A single woman, aged 32, a research chemist, received in January, 1946, a culture of *C. immitis* from which she prepared subcultures. On March 8 she complained of malaise and hoarseness, and though there were no abnormal physical signs a chest radiogram was taken, which showed a slight loss of translucency at the left apex. The patient was afebrile; erythrocyte-sedimentation rate (E.S.R.) 10 mm./hour (Wintrobe); no sputum. Early pulmonary tuberculosis was diagnosed, and the patient was kept under observation but allowed to return to work. Sputum obtained in July gave no growth on Sabouraud's medium, but a small group of acid-fast bacilli was found on concentration, a finding that was not confirmed. Further chest radiograms were taken, and by September, 1946, the chest was considered to be clear.

On Dec. 26, 1946, and Jan. 20 and 30, 1947, the patient prepared extracts of the fungus for skin-testing. This was done by scraping a dry culture into a receptacle and grinding it with saline. Since much dust was produced in the process, the patient wore a gauze mask. On Jan. 2 she developed malaise and an ache in the right side of her chest, which was moderately severe but not bad enough to prevent her working. On the 14th she was skin-tested with several extracts and gave a positive reaction to that of *C. immitis* after 24 hours. Next day her left elbow became painful and slightly swollen, she noted red bumps on her shins, and a dry unproductive cough developed. On the 31st she was admitted to University College Hospital. Physical examination revealed a young woman of slight build, afebrile, and not seriously ill. The chest showed impairment of percussion note at both bases, some diminution of movement at the right apex, and a few dry râles at the right apex and mid-zone. The left elbow was normal, and the erythema nodosum was fading.

The patient's only symptom at this time was a cough, which early in February became productive of a little mucoid sputum, which continued for three weeks. Physical signs cleared within a few days of admission. The patient was treated by rest in bed until the middle of March, when she left hospital for a convalescent home before returning to work early in April.

**Investigations.**—Blood-count, apart from a moderate microcytic anemia (Hb 70%), was normal. E.S.R. (Westergren) on Feb. 1 was 58 mm./hr.; Feb. 19, 26 mm./hr.; March 11, 26 mm./hr.; May 28, 15 mm./hr. Complement-deviation tests on Feb. 14: Wassermann reaction negative; coccidioides antigen negative.

**Skin tests:** Mantoux test 1 in 10,000 weak positive, 1 in 100 positive; coccidioides extract (Feb. 14) very strong positive with induration and vesication.

**Sputum:** no tubercle bacilli on direct examination, culture, or guineapig inoculation. (Direct examination was repeated on six occasions and gastric contents on three occasions also with culture and guineapig inoculation.) Direct examination and culture on Sabouraud's medium for *C. immitis* negative (six occasions with sputum, three with gastric contents).

Guineapig (intraperitoneal) inoculation after copper-sulphate concentration gave multiple granulomatous lesions in the guineapig after 4 weeks, which on culture and in section were identified as showing *C. immitis* (fig. 1).

(The cultures and sections have been examined at the London School of Hygiene and Tropical Medicine by Dr. J. T. Duncan, who confirmed the identification.)

**Radiography of chest:** Jan. 24, 1947, small irregular patches of consolidation scattered in both lungs (fig. 2); Feb. 26, consolidations show some clearing; March 10, tomograms show no evidence of cavitation; March 13, no change since Feb. 26; March 28, further clearing; May 28, almost clear.

#### DISCUSSION

The patient probably acquired the infection during manipulation of the cultures on Dec. 26, 1946, which gives an incubation period of 7 days. This is the lower limit of the usually accepted time of 1-4 weeks (Goldstein and Louie 1943) or 8-21 days (Smith 1943).

The symptoms recorded were the commonest observed by Sweigert et al. (1946), who reported pain in the chest in 80%, cough in 50%, and fever in 61%. The patient was probably febrile before admission to hospital, but no record is available. The occurrence of joint swellings has been variable: Sweigert et al. observed none in their series, whereas Goldstein and Louie (1943) report arthralgias in 30%, and Willett and Weiss (1945) found hot swollen joints in 4% of their patients. The original San Joaquin Valley fever was characterised by erythema nodosum, but more recent reports indicate that it only occurs in about 5% of cases (Smith 1946) and more commonly in women (Smith 1940). In the present case the

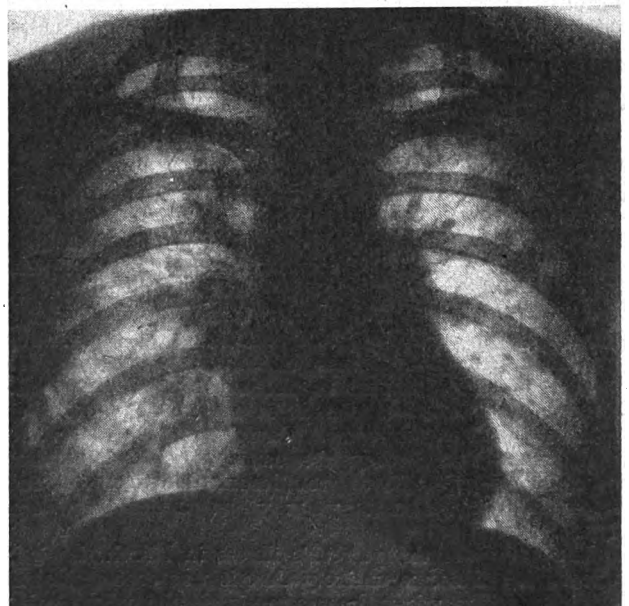


Fig. 2.—Chest radiogram Jan. 24, 1947, showing small irregular scattered areas of opacity in both lung fields.

eruption developed 13 days after the initial symptoms, the usual interval being from the second to the twentieth day (Smith 1943). The appearance of the erythema the day after skin tests has been reported previously (Smith 1942), and Kessel (1939) has reported a relapse of the erythema produced in the same way.

*Identification of the organism in the sputum* by direct examination is not entirely reliable; the most satisfactory method is by isolation on culture and guineapig inoculation. In the present case the sputum was concentrated by the copper-sulphate method of Smith et al. (1941) and then inoculated intraperitoneally. In the American reports it is apparently more usual to be able to isolate the organism by culture and to confirm its identity by guineapig inoculation; there are, however, references in the literature to successful inoculation of sputum and gastric contents after concentration (Dickson 1937, Smith 1943).

In doing the skin tests, extracts were used which the patient had prepared herself. No standardisation was possible, but eight other workers in the same laboratory were tested with negative results. The reaction was most marked at 48 hours, when erythema, induration, and vesication were present; these faded in a few days, leaving some residual staining. There was a transient erythema within 15 min. of the injection, which has been previously commented on by Hirsch and Benson (1927). The skin test becomes positive within 10-45 days of the onset of symptoms; whether it remains so for life is uncertain, but Cheney and Denenholz (1945) suggest that on recovery from a primary infection it may become negative. The skin test in humans is to be regarded as specific for infection with *C. immitis*, though Emmons and Ashburn (1942) have reported positive tests in animals infected with *Haplosporangium parvum*, an organism which has not so far been reported in man. Serological investigations in the present case were hampered by lack of a suitable antigen for precipitin and complement-fixation tests; an attempt at the latter with skin-test extract gave a negative result.

*Radiographic changes in the lungs* have been extensively reported by Sweigert et al. (1946) and Rakofsky and Knickerbocker (1946). Abnormalities are almost invariably found in the initial stages, either a single area of pneumonic consolidation or multiple areas of infiltration. These may clear rapidly, the average time given by Colburn (1944) being 40 days, or residual nodules or cavities may occasionally persist and give rise to difficulty in diagnosis.

*Treatment* in the acute stage is symptomatic and it is usually advised that the patient should be kept in bed until the E.S.R. has fallen; as a safeguard against the possibility of dissemination. Such a policy was not followed very closely in the present case because of the rarity of dissemination in women and in patients who have had erythema nodosum (Smith 1943). Warning signs of impending dissemination include persistent high E.S.R., rising complement-fixation titre, falling precipitin titre, and the skin test may become negative (Sweigert et al. 1946); Winn and Johnson (1942) regard increasing hilar adenitis on radiological examination as a serious feature. The management of any case should also include serial radiograms to check the clearance of the lung lesions. Persistent nodules are not dangerous or likely to cause symptoms. Cavities may appear and persist for years; they are usually symptomless but occasionally give rise to troublesome hæmoptyses, and in such cases lobectomy may be indicated (Winn 1942).

The nature of the patient's illness in March, 1946, is uncertain; it seems unlikely that it was coccidioidal in origin, and it may have been a minimal tuberculous lesion or a non-specific pneumonitis associated with the infection of the upper respiratory tract then present.

*Laboratory Infections.*—Several reports of laboratory infection have been published. Dickson and Gifford (1938) report a case which drew Dickson's attention to lung infections with this organism: a young man who lifted the lid of a petri dish containing an old culture was infected by the cloud of spores that rose. Tomlinson and Bancroft (1928) report a case in a patient who developed a granuloma as a result of a laboratory infection. Bush (1943) reports a patient who was infected while mounting specimen cultures. Smith (1942) reported that, of the people working in his laboratory, 21 gave positive skin tests, though none had lived in endemic areas: 12 were detected when the test was first introduced, and the remaining 9 were infected soon after joining the staff, 5 of them asymptotically. Willett and Weiss (1945) mention that one of their technicians developed a positive skin test without any clinical evidence. The danger of laboratory infection is well recognised in the United States; Goldstein and McDonald (1944) state that they have discontinued culture on Sabouraud's medium as being too dangerous, and Keeney (1946) has designed a protective cabinet in which to manipulate cultures of the organism.

#### SUMMARY

A case of primary pulmonary coccidioidomycosis in a laboratory worker in England is described.

The clinical and pathological features of the disease are reviewed.

Laboratory infections have been collected from the literature.

I wish to thank Dr. Andrew Morland for permission to report this case; Dr. S. Cochrane Shanks for the radiograms; Dr. Joan Stokes for the bacteriological investigations; and Mr. J. Foreman for the photographs.

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“ . . . The epileptic temperament has been described as hypersensitive, egocentric and with violent moods and tempers. I doubt if there is a specific epileptic temperament. If there is, not more than one epileptic in ten possesses it, and many non-epileptics certainly do. Temperamental difficulties in epileptics can be separated into two groups. In the one they occur periodically either before or after, or independently of fits. They are as much manifestations of epilepsy as are the fits themselves, can be demonstrated on the electro-encephalograph and are not readily accessible to psychotherapeutic treatment. In the other, and larger, group the difficulties arise as the result of mishandling at home or school. — Dr. TYLOR FOX, *Public Health*, May, 1948, p. 150.

## POSTCRICOID PHARYNGO-ŒSOPHAGEAL PERFORATION DUE TO ENDOSCOPY TREATED BY IMMEDIATE SUTURE

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As Schindler (1940) and Fletcher and Avery Jones (1945) have pointed out, the danger of lower œsophageal injury that beset gastroscopy with the older rigid instruments has been completely eliminated by the adoption of the flexible gastrocope. Also the small but definite risk of gastric or jejunal perforation, which arose in the early years of the new instrument, was soon recognised by Schindler (1940) to be due to the Henning sponge-rubber gastrocope tip then much in vogue, and since its abandonment in favour of a plain rubber or metal terminal no further examples of this injury have occurred. But accumulating experience has disclosed and emphasised another danger, not originally suspected—perforation of the lower part of the pharynx or extreme upper end of the œsophagus—and this complication now alone withholds from modern gastroscopy the distinction of being an entirely riskless procedure.

Though Schindler (1940), White (1941), Touroff (1941), and Paul and Lage (1943) had each recorded a perforation of this type with the flexible gastrocope, it is principally to Fletcher and Avery Jones (1945) that we are indebted for drawing attention to these post-cricoid accidents of gastroscopy. They reported 3 of these mishaps from their own series of 2800 gastroscopies and stated that they knew of a further 7 in the experience of fellow gastroscopists. Hermon Taylor (1945), Freeman (1945), and Paul and Antes (1946) have published 3 more perforations since, bringing the total of recorded cases to 17. Human nature being what it is, we may be sure that there have been other instances of this complication of gastroscopy that have not received their due measure of publicity.

Œsophageal and pharyngeal perforation has long been a recognised danger of œsophagoscopy (Jackson and Jackson 1934), and few œsophagoscopists of experience have not had one or more of these catastrophes (Simpson 1947), though here again reticence has often attended their publication. Mosher (1935) had 19 perforations in 938 œsophagoscopies. Most of the perforations with œsophagoscopy occur at the site of the pathological condition for which the examination has been undertaken, and they are often the direct result of endoscopic manoeuvres such as the dilatation of a simple or malignant stricture; but a few are produced in the post-cricoid region remote from the primary lesion and present the same general characteristics as those due to gastroscopy. Hoover (1944) had 2 cases of this latter type in his group of 8 œsophagoscopy perforations.

I have recently observed 2 cases of post-cricoid perforation, one due to œsophagoscopy and the other to gastroscopy, at St. Mary's Hospital. They are reported here partly because they throw some light on the aetiology of these injuries, but chiefly because in one of them the innovation of immediate suture was introduced with a successful result.

**Case 1.**—A rather stout woman of 65, complained of attacks of upper abdominal fullness and flatulence for twelve years, and of a small hæmatemesis two days before admission. Clinical examination negative. Radiology showed fairly large hiatus hernia in diaphragm, with short œsophagus; no œsophageal ulcer seen.

Œsophagoscopy was performed by Mr. John Simpson at 12 noon on Nov. 20, 1946, under local anaesthesia, thiopentone and curare, with Negus pattern œsophagoscope: no difficulty whatsoever experienced in passing instrument;

herniated portion of stomach entered; no ulcer or other lesion found to explain bleeding. Next morning the patient appeared well but complained of pain in her neck; took fluids fairly well by mouth. That evening slight swelling and surgical emphysema noted on front and both sides of neck. Temperature 99.9°F. Mouth feeding stopped; rectal fluids and systemic penicillin 100,000 units three-hourly started. During next three days swelling of neck increased and spread to face, especially on right side, where eyelids became œdematous. Temperature rose to 102° and 103°F. Cyanosis and dyspnoea developed. Oxygen inhalations and intramuscular 'Sulphamezathine' 2 g. four-hourly given.

On Nov. 26 incision by J. C. G., under local anaesthesia, along anterior border of right sternomastoid, and deepened to side of pharynx, in an effort to decompress neck and mediastinum and relieve dyspnoea. Posterior aspect of pharynx not exposed. Operation unsuccessful, no pus or gas under tension being encountered, and only a little frothy fluid escaping. Wound loosely packed with soft-paraffin gauze.

The patient's condition continued to deteriorate, and she died on Nov. 28.

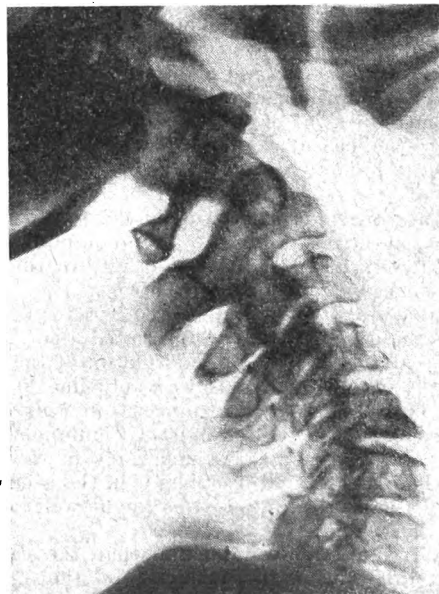
*Necropsy:* large abscess cavity, lying behind pharynx and œsophagus and extending from base of skull to bifurcation of trachea below, communicated with lumen of œsophagus through a longitudinal perforation 0.6 cm. long in posterior wall just to left of midline and about 1 cm. below lower edge of cricoid cartilage

**Case 2.**—A lean man of 63, of fair physique, complained of attacks of indigestion, relieved by alkalis, for fourteen years, and of occasional vomiting. Clinical examination negative. Barium meal showed moderate-sized peptic ulcer on lesser curvature and persistent filling defect just below cardia.

Gastroscopy by J. C. G. at 2.30 p.m. on July 8, 1947, with Hermon Taylor flexible gastrocope; passage of instrument particularly easy, but immediately after its introduction the patient had a bout of coughing lasting 1/4 min., subsequently being perfectly comfortable. Medium-sized healing simple ulcer seen on middle of lesser curvature with an ulcerating carcinoma about 1 1/2 in. in diameter just below cardiac end of lesser curvature and extending on to anterior wall of stomach. On withdrawal tip of instrument was blood-stained.

At 5.30 p.m.—i.e., three hours after gastroscopy—the patient was soundly asleep, but his neck appeared swollen, and on palpation surgical emphysema was detected on both sides and in front. No dyspnoea, cyanosis, or abnormal chest signs. Radiography showed much emphysema in cervical region, none in mediastinum.

Operation by J. C. G. at 7.15 p.m. on July 8 under thiopentone, cyclopropane, and oxygen. During introduction of intratracheal anaesthetic tube anaesthetist made cursory



Lateral view of extended cervical spine, showing spondylitis of C4-C7, with prominent lower edges to vertebral bodies C4-C6 (case 2).

pharyngoscopic inspection of posterior pharyngeal wall as far down as cricoid region, but no perforation was seen. Oblique incision was made along anterior border of left sternomastoid from level of upper border of thyroid cartilage to sternoclavicular joint, and deepened through platysma and deep fascia. Emphysema of tissues rendered subsequent dissection difficult. Sternomastoid was retracted outwards, omohyoid divided, and sternothyroid and sternohyoid retracted medially. Carotid sheath then exposed deeply laterally, and thyroid gland medially. After division of middle thyroid vein and inferior thyroid artery, gland was freed for rotation of thyroid cartilage and trachea to right to expose posterior pharyngo-œsophageal wall. Circular perforation about  $\frac{1}{2}$  in. across found in midline of posterior wall of pharynx about  $1\frac{1}{4}$  in. above junction with œsophagus. Pharyngoscopy at this stage by anaesthetist clearly showed perforation; fairly large rubber tube passed by him down pharynx to demonstrate lumen and facilitate suture. Perforation was closed by suturing mucosa with a continuous fine catgut stitch, and muscles and fascia with interrupted sutures of fine black silk. Very satisfactory closure obtained. Penicillin-sulphonamide powder applied. Rubber drain laid down to site of perforation and brought out through middle of wound, which was then closed by suturing platysma and approximating skin edges with Michel clips. Finally Ryle's tube passed down pharynx and œsophagus for feeding purposes.

Postoperatively the patient received penicillin 100,000 units three-hourly and sulphamezathine 1 g. four-hourly. Fluids given through Ryle's tube till patient withdrew it, because of discomfort, after thirty-six hours. Reintroduction proved difficult and was not persisted with. Rectal feeds for another twenty-four hours, by which time he was taking small mouth feeds. Eating semi-solid diet on sixth day. Drain out at end of forty-eight hours; wound healed by first intention, with no infection; clips out on fifth day. The patient was discharged on tenth day, eating normal diet; for readmission, after short holiday, for gastrectomy.

On Aug. 1, 1947, transthoracic resection of proximal two-thirds of stomach and distal  $1\frac{1}{2}$  in. of œsophagus, followed by œsophagostomy. The patient made a satisfactory recovery, marred only by slight trouble with left pleural effusion.

#### ETIOLOGY

The location of the perforation in both of the present cases, as in all those previously recorded, in the posterior wall of the last 2 in. of pharynx or first 2 in. of œsophagus naturally excites a search for any structural peculiarities in this region predisposing it to injury. At first sight the sphincter mechanism provided by the cricoid cartilage and the cricopharyngeus muscle might be considered important, because spasm of this sphincter is well known to require careful negotiation during instrumentation. It is unlikely, however, that cricopharyngeal spasm plays any large part in the production of these injuries, because in many of the published cases, including both of mine, no difficulty was experienced during introduction of the instrument, and because spasm of the cricopharyngeus would not explain the œsophageal lesions, which lie below the level of this muscle.

It seems particularly noteworthy that the perforations occur only in the posterior wall. It is common knowledge that the last 2 in. of the posterior wall of the pharynx is weakened by a dehiscence between the transverse and oblique fibres of the inferior constrictor muscle. It is not perhaps so generally appreciated that there is a similar weakness of the uppermost 2 in. of the posterior wall of the œsophagus owing to a splitting of the longitudinal fibres so that the mucosa in this region is supported only by circular muscle (Cunningham 1943). Therefore there is a relative deficiency in the posterior wall of the pharynx and œsophagus in the area of distribution of these injuries, and this might well be a factor in their causation.

Probably much more important than the structure of the posterior wall is its intimate relationship to the cervical spine, as emphasised by Hermon Taylor (1945) and Freeman (1945). When the head is extended, as it

must be during the introduction of the gastroscop or œsophagoscope, the bodies of the cervical vertebræ, particularly the 5th, 6th, and 7th, form a prominent bony convexity which pushes forward the posterior wall of the pharynx and œsophagus. Consequently the tip of the instrument impinges on these vertebræ during introduction, and the pharyngo-œsophageal wall, sandwiched between the two, may be subjected to compression sufficient to tear it. Further, after the instrument is in situ, its rigid shaft may exert a more protracted, but perhaps equally injurious, pressure against the cervical prominence, which might immediately split the pharyngeal or œsophageal wall or lead to localised necrosis with later disintegration.

It must be realised also that the anterior surface of the bony prominence provided by the cervical spine is seldom perfectly smooth, being marked by transverse ridges corresponding to the lower borders of the vertebral bodies, and in patients with spondylitis may be rendered extremely rough and irregular by the presence of pronounced osteophytes or spurs. Mosher (1927) has demonstrated that gross indentation of the œsophagus may be produced by large cervical exostoses; and Hoover (1944) attributes both of his postericoid œsophagoscopy perforations to the presence of such bony projections, which were fractured by the passage of the instrument. The accompanying figure shows a lateral view of the cervical spine in case 2. It will be conceded, I think, that the rather prominent rough lower edges to the front of the 5th and 6th cervical vertebræ, lying about the level of the pharyngeal perforation in this case, may well have been ætiologically important. No similar radiological evidence is available from case 1. I have also recently examined the anterior surface of the cervical spine in some 60 bodies in the necropsy room, and, though I have not encountered any very well-defined cervical exostoses in this small group, I have been impressed by the sharp prominence of the lower borders of the bodies of the cervical vertebræ in the average case. I can readily appreciate that they may damage the posterior pharyngo-œsophageal wall when the latter is firmly pressed against them with the œsophagoscope or gastroscop, particularly when the neck is unduly extended.

#### PREVENTION

Some important points in prophylaxis emerge from these reflections. The desirability becomes apparent of avoiding unnecessary extension of the neck during the introduction of the gastroscop or œsophagoscope, and while it is in situ. Also, during the passage of the instrument, it appears to be an excellent plan to try to lift the back of the tongue and larynx forwards with the left hand, as recommended by Hermon Taylor (1945), to minimise the pressure of the tip against the posterior pharyngo-œsophageal wall and cervical spine. The utmost gentleness at all stages is essential, and in the face of resistance no force should be used. The question of radiological recognition of cervical spurs also arises. Routine radiography of the cervical spine is but a small addition to the already elaborate X-ray examination carried out on these cases and should certainly be undertaken to reveal any potentially dangerous cervical exostoses which might contra-indicate endoscopy.

#### TREATMENT

These injuries have hitherto been treated conservatively in the hope that the perforation will close spontaneously without serious cervical cellulitis or mediastinitis developing. To that end mouth feeding is stopped, fluids are given rectally or intravenously, and intensive chemotherapy with sulphonamide or penicillin is begun. Undoubtedly some patients have recovered under this régime, often after subsequent surgical intervention

to deal with resulting infection in the neck or the mediastinum, as described by White (1941) and Churchill (1935); but in others the outcome has been as in case 1—death from mediastinitis. Thus of the 17 recorded postericoid perforations due to gastroscopy, all but one apparently treated in this primarily expectant fashion, no less than 10 were fatal, and one gathers from the published reports that the results in the œsophagoscopy injuries have been equally bad.

Admittedly most of these cases were treated without penicillin, and it might be anticipated that, now penicillin is generally available, the prognosis under conservative treatment should be much improved. But the death of case 1, who had massive penicillin therapy from the start, lends no support to this idea. The necropsy finding in this case of a large perforation in the posterior pharyngeal wall, communicating readily with a big abscess cavity lying behind the œsophagus and extending well down into the mediastinum, makes it clear that, at any rate with a macroscopical perforation which permits of continual leakage of saliva and constant reinfection of the neck and mediastinum, penicillin alone cannot be relied on to avert a fatal mediastinitis.

The only treatment that offers these patients a reasonable chance of survival is an operation to close the perforation and stop the leakage, or to divert the escaping pharyngeal fluids from the mediastinum to the exterior. And it was this conviction that led to the surgical treatment used in case 2. The operation performed in this case was identical with that practised for the removal of a pharyngeal pouch, up to the point of exposure of the back of the pharynx and œsophagus. The perforation was closed with two layers of sutures, a rubber drain being left down to the site of the perforation.

So far as I can ascertain, this is the first occasion on which a postericoid perforation due to gastroscopy or œsophagoscopy has been immediately sutured. In view of the poor results of conservative treatment this may seem surprising. Pearse (1933) did recommend immediate operation to pack off the retro-œsophageal space with gauze so as to protect the mediastinum from infection and to provide external drainage. But, though he showed the perforation exposed on the back of the pharynx in one of his illustrations, he did not advocate any attempt at its suture; and Touroff (1941), who also operated on a case, mentions that he deliberately refrained from suturing the perforation because of the bruising of its edges. The attitude of helpless expectancy in the face of these accidents has, for the most part, prevailed.

One of the main reasons for this reluctance to operate in these cases has been the frequent uncertainty about the exact location of the perforation. In case 2 we knew, from our survey of the recent reports on gastroscopy injuries, that the lesion must be in the cricoid region, where we could easily expose it. Further, we reckoned that, if for any reason the perforation proved unsuitable for suture, we could at least carry out Pearse's (1933) operation of packing and drainage. And, since the operative risk from either of these procedures was likely to be negligible, there seemed to be nothing to lose from resorting to surgery. But until quite recently it has not been realised how constant is the localisation of gastroscopy perforations to the vicinity of the pharyngo-œsophageal junction; and until the last few years most endoscopy perforations have probably been due not to gastroscopy but to œsophagoscopy, in connexion with which, as already mentioned, only a small proportion of the injuries occur in the postericoid region. The surgeon, thus denied a clear objective, has not unnaturally been unwilling to intervene. It was largely dubiety about the site of injury that deterred us from

an early recourse to surgery in case 1, though in retrospect I think it should have been possible to localise it correctly on clinical grounds.

#### CONCLUSIONS

As a result of these experiences I submit that surgical emphysema in the neck after gastroscopy is an indication for immediate exploration of the postericoid region. The same complication after œsophagoscopy requires a more discriminating approach. In trying to diagnose the site of the perforation in the latter case, consideration should be given to the following points. If the œsophagoscopy and clinical and radiological examination have shown no pathological condition in the œsophagus, the injury is almost certainly of postericoid type. If, on the other hand, a carcinoma or fibrous or spasmodic stricture of the œsophagus has been revealed, and particularly if dilatation or biopsy was attempted, the odds are strongly in favour of the perforation having arisen in association with it rather than in the neck. Radiography of the mediastinum and neck, to demonstrate the extent of the emphysema, may help in the early stages, the existence of gas only in the cervical tissues or in the mediastinum indicating a postericoid or an intrathoracic injury respectively. Emphysema, however, soon spreads from neck to mediastinum or vice versa, rendering this examination diagnostically valueless. Radiology of the cervical spine may also help by showing an obvious anterior cervical osteophyte. Finally, a repeat œsophagoscopy or pharyngoscopy may demonstrate the perforation in the pharynx or œsophagus. If the injury can be localised to the postericoid region, immediate suture should be carried out as in gastroscopy cases. The treatment to be adopted if it lies in the intrathoracic part of the œsophagus is beyond the scope of this paper, but in these days of safer œsophageal surgery, probably here also early intervention, though involving a much more serious operation, offers the best prospect.

#### SUMMARY

Perforation of the posterior wall of the pharynx or the œsophagus in the vicinity of the cricoid cartilage is a small but definite risk associated with gastroscopy and œsophagoscopy.

The main intrinsic predisposing factor seems to be the anterior prominence of the extended cervical spine in this region, particularly when roughened by the presence of osteophytes due to spondylitis.

The prophylactic measures to be taken by the endoscopist include routine radiology of the neck to exclude dangerous cervical spurs, and, during instrumentation, the utmost gentleness and avoidance of undue extension of the neck at all stages.

The correct treatment is immediate suture and drainage, followed by intensive chemotherapy. In œsophagoscopy cases it is necessary to distinguish postericoid perforation from the more frequent lower œsophageal injuries.

I am indebted to Prof. G. W. Pickering for kind permission to report these two cases, which were both under his care, and to Dr. A. H. James for the prompt diagnosis of disaster in the second case.

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## SURGERY OF PULMONARY STENOSIS

A CASE IN WHICH THE PULMONARY VALVE WAS SUCCESSFULLY DIVIDED

T. HOLMES SELLORS

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OBSERVATIONS and studies on the nature and situation of the pulmonary stenosis in Fallot's tetrad show that there are considerable variations in its extent and degree. Often there is narrowing in the conus or common pulmonary trunk or a well-marked subvalvular stenosis, but there is little reference to obstruction at the actual valves.

If the stenosis is localised to the valve area the relieving operation may well take a different form from the artificial ductus type of anastomosis adopted in the Blalock<sup>1</sup> or Potts<sup>2</sup> operation. In the Blalock operation a large systemic artery (usually the right subclavian) is anastomosed to a pulmonary artery, while in the Potts operation a small opening is constructed between the left pulmonary artery and the aorta. If, however, it was possible to divide an obstructing valve, some of the requisites of treatment would be obtained, in that blood from the right ventricle could reach the lungs, without deflecting blood from a systemic vessel. For relief to be obtained in this way, the pulmonary arteries must be capable of carrying the blood released into them and not be too small or atrophic. This also applies to the anastomotic operations, which require a pulmonary vessel of adequate size for their success.

Attempts to divide the valves of the heart have been recorded at various times in the past 30 years, and a long survival was obtained by Elliot Cutler and Beck,<sup>3</sup> who operated on the mitral valve. The recent development of surgery in congenital heart disease has lightened many of the original difficulties of attack, and it is not too much to hope that the surgery of valvular stenosis will before long become a practicable proposition.

A short account is given here of the findings in a patient in whom the pulmonary valve was successfully divided.

### CASE-RECORD

A youth of 20 years (referred by Prof. G. W. Pickering) was suffering from advanced bilateral pulmonary tuberculosis and also presented a typical clinical picture of Fallot's tetrad. The red-cell count was over 6,000,000 per c.mm., with a hæmoglobin of 115%. Dyspnoea was severe as a result of cardiac and pulmonary insufficiency, and the boy was deeply cyanosed with definite drum-stick clubbing of fingers and toes. The heart was not unduly enlarged. There was a coarse systolic murmur with a thrill to the right of the sternum. On fluoroscopy pulsation was absent in the region of the conus and in the vascular shadows in the lungs. The pulmonary condition appeared to be moderately stabilised though there was radiographic evidence of cavitation at both apices, more marked on the right.

It was decided that little could be done for his lung condition unless the heart could be improved, and for this reason an operative attempt along the lines suggested by Blalock for pulmonary stenosis was considered. Cardiac catheterisation was attempted on two occasions, but for technical reasons no satisfactory readings were obtained. In view of the lung condition, an operative approach on the left side was preferred to one on the right.

*Operation, Dec. 4, 1947.*—The anaesthetic (endotracheal ether and oxygen) was given by Dr. Parry Brown. The chest was opened through an anterior incision along the 3rd inter-space. The lung, which was slightly adherent against the mediastinum, was reflected away and the pericardium exposed

and opened. It was then seen that the common pulmonary trunk was enlarged and that the left pulmonary artery was of normal size. There was a small fistulous opening (a patent ductus arteriosus) between the aortic arch and the pulmonary artery, but occlusion of this by digital pressure made no difference to the character of the thrill or to the patient's condition. In the lower part of the conus it was found that a firm structure was thrust from the ventricle into the pulmonary trunk with each heart beat, and this was interpreted as being an imperforate pulmonary valve. The infundibular region of the right ventricle was chosen as the area from which the valve could be best approached and several holding sutures were inserted, taking care to avoid any branches of the coronary artery. A long tenotomy knife was then thrust between the stitches till it engaged the resistant valve or septum which was incised and cut in two directions. Some sense of direction was gained by placing a finger over the conus area and gauging the distance of the knife from the surface, but it is possible that division on the deeper aspects was not as thorough as on the superficial aspects. The opening in the ventricle was closed with three linen-thread sutures, using the preliminary stay sutures to control the hæmorrhage. It is estimated that 4-8 oz. of blood was lost during the procedure.

At the end of the operation the pulsation in the conus was more forceful and the well-marked thrill previously present was converted into one of much lower frequency and intensity and in a different situation.

In spite of the lung condition the patient's recovery was straightforward and he was definitely, though not completely, relieved from his cyanosis. He is now at a sanatorium and no complications have developed.

### DISCUSSION

There is no doubt that the operation could be improved on future occasions. A more appropriate tenotomy knife or valvulotome might be employed and bleeding might be controlled more accurately.

Another patient who brought the importance of valvular stenosis to notice was a small boy diagnosed as having an advanced Fallot's tetrad. A Blalock type of operation was decided on and the right chest opened. It was found that the hilum was enveloped in a mass of tortuous collateral vessels, and as these were being divided the heart rhythm became irregular. The operation was stopped and the heart action became weaker; various resuscitative methods were applied but the patient died. When the heart was examined at necropsy there were two significant findings. The heart muscle and anatomical arrangement of the aorta with patent interventricular septum conformed to the ordinary Fallot type, but the pulmonary vessel presented as a ring or septum, in the centre of which was a narrow hole less than 1 mm. in diameter. The common pulmonary trunk and main artery were slightly smaller than normal, but their walls were so thin that it seemed improbable that they could have carried much blood during life. Moreover, they were so thin and friable that it would have been almost impossible to use them in making an anastomosis.

If this type of lesion is to be encountered at all often in this country some modifications in the operative approach could be considered. Left-sided exposure of the heart followed by deliberate incision of the pericardium as an initial step allows the valve area to be seen and palpated. At the same time the intrapericardial part of the left pulmonary artery can be examined, and it has been found that dissection of the vessel from this end is more simple than starting from the extra-pericardial position. This approach also affords a longer stretch of available pulmonary artery than if dissection is confined to the pleural cavity. If an anastomosis is to be performed the available length of left subclavian artery is the determining factor for the Blalock procedure. Admittedly this vessel is not so conveniently placed as the right subclavian, but it usually affords a satisfactory anastomosis. If the anastomosis is to be made with the

1. Blalock, A., Taussig, H. B. (1945) *J. Amer. med. Ass.* 128, 189.  
2. Potts, W. J., Smith, S., Gibson, S. (1946) *J. Amer. med. Ass.* 132, 67.  
3. Cutler, E. C., Beck, C. S. (1929) *Arch. Surg. Chicago*, 18, 403.

aorta the technique described and carried out by Potts could be followed. The advantage of the left-side approach is that it permits the valve to be inspected and also gives a good exposure of both the main pulmonary trunk and left pulmonary branch, before the surgeon commits himself to any definite procedure. An alternative of two anastomoses is also offered if this is found to be necessary.

## New Inventions

### CONNEXIONS FOR ENDOTRACHEAL ANÆSTHESIA IN INFANTS WITH HARE-LIP

In endotracheal anæsthesia in small children and infants it is desirable to minimise resistance to respiration, and to avoid compression or kinking of the fine tracheal tube within the mouth or the pharynx and encroachment on the field of operation in head and neck and intra-oral surgery—e.g., repair of hare-lip or of cleft palate. The connexions described here were designed by me in 1942 to meet these requirements after I had carefully taken the average of sizes and shapes in vivo and in the post-mortem room.

The infant size (figs. 1 and 2), in which the principle of Ayre's T-piece has been adopted, was designed especially for hare-lip. The horizontal part (fig. 1b), which serves as air inlet and is slightly S-shaped, follows the lateral border of the tongue to near the aryepiglottic fold. An ordinary rubber or plastic endotracheal tube, cut down to half length, is fixed to its slightly tapered and corrugated proximal end, which gives the necessary curve for easy introduction. The gas mixture is delivered through a hole at the junction of b with c (fig. 1). The hole is of the size of a pinhead. The anæsthetic machine is connected with c (fig. 1) by the same tubing as is used for the Waters canister without interposing a bag. For hare-lip operations the sterile towels are fixed so as not to impede free respiration through b. In operations requiring full draping of head and tube—e.g., mastoidectomy—b is fitted with any full-sized large-bore endotracheal tube, protruding with its free end from under the covering of the towel. Part b may also be connected

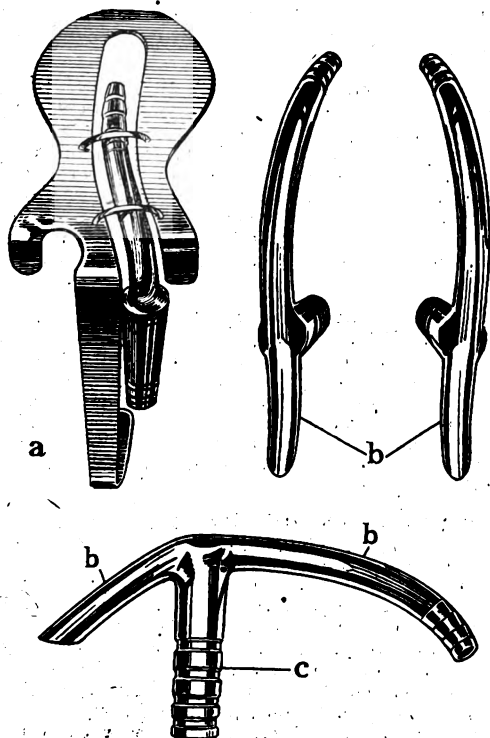


Fig. 1.—Connexions for endotracheal administration of anaesthetics to infants and children: (a) connexion for cleft palate, used with tongue-depressor; (b) horizontal part, (c) vertical part, of hare-lip connexion.

### ADDENDUM.

Since this article was written an admirable paper by R. C. Brock has appeared on the same subject (*Brit. med. J.* June 12, p. 1121). He deals with the subject more thoroughly, and he records 3 successful cases of valve division. The case reported here was operated on in December, 1947, and the article has not been revised in the light of Brock's observations.

to the suction apparatus if desired. The connexions are made in pairs to suit the site of operation, and lie in, or protrude from, the angle of the mouth farthest from the lesion (fig. 2).

The right-sided infant tube can also be used with a tongue-depressor of the Dott gag, which has been modified for the purpose. This tongue-depressor (fig. 1a) has a slightly curved central slit leaving about 1 in. of the posterior part intact but being open anteriorly. In this slit lies the rubber tube with its slightly elongated metal connexion, which is curved instead of angled but otherwise only a modified Rowbotham connexion. Two wire bridges across the slit prevent the tubes from bobbing out of, or protruding through, the gap. Compression of the rubber part posteriorly is impossible owing to the resiliency of the floor of the mouth. It is essential that the tongue be kept exactly central underneath the tongue-depressor (best achieved by a fine retaining stitch inserted by the surgeon).

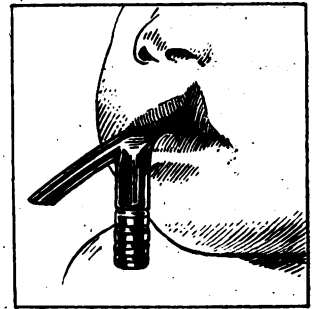


Fig. 2.—Connexion in infant's mouth. exactly central underneath the tongue-depressor (best achieved by a fine retaining stitch inserted by the surgeon).

Corresponding to the three sizes of tongue-depressor there are three sizes of metal connexions, to be used with semi-open or closed absorption anæsthesia. The connexions are inexpensive and easy to make and can be cleaned readily.

I wish to thank Dr. J. Gillies for his encouragement and advice, Mr. A. B. Wallace for his patience and coöperation during the trial period, and Mr. John Morrison for making the first pattern, now executed by Messrs. Archibald Young and Sons.

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MARGOT W. GOLDSMITH  
M.D. Freiburg, D.A. Lond.

"... the intensification of political activity makes excessive demands upon people who would be far happier thinking much less about national economics and world-politics. Newspaper articles very often contain sentences such as the following, culled at random from an article demanding more paper for printing: 'It can be asserted without fear of challenge that at no previous period of history has there been such a mass of momentous issues upon which the ordinary citizen, if democracy is to survive, must form considered judgments as at the present time.' And to an increasing extent, these are particular issues, upon which the generality of citizens cannot possibly form a judgment of any worth, for they are not in the position to act, and can form only a hearsay opinion.' They are not responsible: certain people are; and if the survival of democracy is really going to depend more and more upon such general judgments of specific issues the conclusion is clear. Democracy is doomed.

"... this stimulation of malapert politics is a spurious substitute for the real interest in his job, his neighbours, his neighbourhood and his recreative life for which the normal citizen needs liberty and responsibility. People will become more non-coöperative and restive and less socially creative until we find our way to a more organic order, in which they have the education and freedom to fulfil their own responsibilities, subordinating even the progress of technics to that end. We shall then be able to rely upon each other, even upon our statesmen and diplomats, to do the best that is possible in the circumstances which they understand. Politics will not be any less important, but more local and personal; national and world affairs will become more quiet because more orderly."—*New English Weekly*, May 13, p. 43.

## Reviews of Books

### Anatomie Radiologique Normale

H. TILLIER, radiologist, Hospitals of Algeria. Paris: Doin. 1947. Pp. 233. Fr. 600.

Dr. Tillier provides a pleasant surprise to anyone who thinks of French North Africa as a physical and intellectual desert. The French have always been ahead in radiological anatomy, the most striking example being the post-mortem studies of the cardiovascular system by Laubry and his co-workers in the early '30s. The present volume, lavishly illustrated with simple yet effective line drawings, is in the best tradition and compares favourably with more ponderous German tomes. The normal anatomy is relatively easy to describe, but the author scores by his excellent presentation of the many variations which are so liable to be interpreted as pathological. This is an ideal textbook for students of radiology, and a useful reference work for radiological departments.

### Handbook on Fractures

DUNCAN EVE, jun., M.D., F.A.C.S., associate professor of surgery, Vanderbilt University. London: H. Kimpton. 1947. Pp. 263. 25s.

Professor Eve says that "the methods discussed are the gleanings from more than 40 years of trials and errors in the field of fracture work," and his book, which is easy to read, should appeal to those who wish to avail themselves of this extensive experience. Being short, it leaves many important aspects almost untouched; classification is in the main dispensed with and many essential details necessary for the teaching of students are omitted. The general treatment of fractures, however, is well described along orthodox lines, and the numerous illustrations are useful.

### Diabetes Mellitus in General Practice

ARTHUR R. COLWELL, M.D., associate professor of medicine, North Western University, Chicago. Chicago: Year Book Publishers. London: H. K. Lewis. 1947. Pp. 350. 29s.

THIS is an interesting and comprehensive book on most aspects of diabetes, but it is not dogmatic enough in telling the practitioner what to do. Though four vague pages are devoted to describing the type of case in which diet without insulin may be tried, the simple criterion usually applied in England—the absence of ketone bodies—is not mentioned. The diet schemes with their insistence on different carbohydrate/fat ratios seem involved, and reminiscent of the days before insulin. On the other hand, the book contains many sections of great interest to the specialist in diabetes, particularly the details of different types of insulin and their mixtures, on which Professor Colwell has done much work.

### Principles and Practice of Obstetrics

(9th ed.) JOSEPH B. DELEE, M.D., late professor of obstetrics and gynecology, University of Chicago; J. P. GREENHILL, M.D., professor of gynecology, Cook County Graduate School of Medicine. London: W. B. Saunders. 1947. Pp. 1011. 50s.

AFTER four years this book now appears in a new and better edition. Its production is excellent, and the division of print into two vertical columns on each page might well be copied in other textbooks of similar size. Several chapters have been added, and it is natural that among so much sound advice there should be statements one can dispute.

The advice to insufflate the vagina in trichomonas infections in pregnancy could be regarded as dangerous, and the injection of varicose veins in the pregnant woman has not the approval of all here.

The chapter on erythroblastosis, by Dr. Davidson, gives a beautiful account of the morbid anatomy, but does not refer to the Fisher classification, which goes far to make the apparent anomalies of this subject intelligible, and also provides a basis for really intelligent treatment. The invaluable Race-Coombs test is not mentioned; no distinction is made between complete and incomplete antibodies; the

value of replacement transfusion of the baby at birth is not discussed; and contributions to the subject from this country seem to get less notice than they deserve. On the prognosis of future pregnancies, nothing is said about the heterozygous father—a factor which may greatly modify the outlook. The vital need for care in transfusion not to iso-immunise the rhesus-negative woman during reproductive life should be more fully stressed—if only because failure in this respect may presently become actionable.

The new chapter on the care of premature babies certainly deserves its place, in view of the enormous wastage of foetal life involved; but the feeding plans are somewhat rigid, and tube feeding and thyroid extract merit inclusion. The chapter on abortion is good, but suggests bias in favour of intervention in incomplete cases. Incidentally, a strongly conservative attitude is taken in septic abortion—except where perforation is presumed, when extirpation is drastically recommended as a matter of course. A rather rapid list is given of about twenty uses of radiography in obstetrics, but a discussion of its limitations might encourage the student to remember that his own clinical judgment is his main shield and defence. It is a pity that the chapter on analgesia and anaesthesia should omit the self-administered methods of obtaining relief, which are becoming such a regular feature of midwifery in this country. Caudal anaesthesia is very fully described.

The book is stimulating enough to provoke argument on these and many other points—e.g., the torture recommended of supplying a breast-pump to a woman with a cracked nipple; the anatomical feasibility of emptying an aborting uterus with the middle finger, as depicted on p. 378; the reduction of the acutely inverted uterus with the placenta still in situ; and uterine tamponade in post-partum haemorrhage. But this is more a tribute to the liveliness of the work than a criticism of its shortcomings, which are few. There is hardly a dull page between its covers, and its enthusiasm is infectious.

P.Q.R.S.T.: A Guide to Electrocardiogram Interpretation (2nd ed. New York and London: Macmillan. 1947. Pp. 84. 17s. 6d.).—This little book, by Dr. J. E. F. Riseman, of Harvard, takes the several waves and segments of the cardiogram in sequence and interprets the significance of changes in each. It is arranged for easy reference and meant to be used when reading actual tracings. Employed in this way it should help the student without taking the place of a textbook.

Ocular Therapeutics (Springfield, Ill.: Charles C. Thomas. Oxford: Blackwell Scientific Publications. 1948. Pp. 112. 18s.).—Prof. William J. Harrison, of Philadelphia, gives some everyday prescriptions used in the treatment of eye disease and injury. Drugs described are classified according to their action on the eye, though many newer ones such as D.F.F. and the 'Benadryl' eye compounds have not been included. The information, though useful, is mostly elementary, and the book will be of more help to general practitioners than to oculists.

An Outline of the Development of Science (London: C. A. Watts. 1948. Pp. 210. 3s. 6d.).—This is an age of compressed food and possibly compressed thought too. Dr. Mansel Davies in this small volume has given enough mental pabulum for the most voracious reader. He brings before us in brilliant array the great names in the history of science from the earliest recorded times, and his book may well stimulate the reader to fuller study of some of its many subjects.

Illustrative Electrocardiography (3rd ed. New York: D. Appleton-Century Company. 1948. Pp. 309. \$6).—In their new edition Dr. Julius Burstein and Dr. Nathan Bloom provide new sections on aspects of cardiography in which there have been recent developments. Thus a number of phonograms are reproduced which show common murmurs with unusual clarity. There is also an outline of bipolar chest leads and of unipolar limb and chest leads, which is sufficiently brief and clear to avoid confusion in the beginner. It is well that no special claims are made for any one technique while the experts still differ. For the rest the established patterns of abnormal cardiograms are well displayed and there is a final chapter on the radiology of the heart with a score or so of illustrations.





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# THE LANCET

LONDON: SATURDAY, JUNE 26, 1948

## Choice of Three

SINCE we last considered the representation of specialists, six weeks ago,<sup>1</sup> the alternatives have become plainer and rather different. There are three main proposals.

The British Medical Association, with some reason, argues that in dealing with the Government the profession should speak with one voice, and that specialists, like their colleagues in other branches of medicine, should be represented through the organisation which already includes some 80% of the doctors of this country. Hitherto this organisation has paid less attention to the affairs of specialists than to those of general practitioners; but in the National Health Service the specialist has equal need of representation, and the structure of the B.M.A. can be modified accordingly. The modification proposed by the council is the establishment of regional committees of specialists, reporting to a central consultants and specialists' committee of the association; but next week's representative meeting at Cambridge is likely to produce a more attractive scheme offering specialists more autonomy and perhaps more influence. The B.M.A., it now appears, might be satisfied if the specialists of the various regions (members or non-members) formed their own committees in their own way, and these could report to an annual conference of which the central consultants and specialists' committee of the B.M.A. would be the executive. The precedent here is the organisation of panel practitioners under National Health Insurance, which has worked through local medical and panel committees, an annual conference, and an executive Insurance Acts Committee. This precedent is not perhaps entirely reassuring, for, as the years have gone by, this nominally separate organisation has been increasingly assimilated by the B.M.A.—as was natural because their interests were closely similar. The emphasis of B.M.A. policy may shift; but, it would certainly be unwise for specialists to rely on representation through the B.M.A. if this were to mean that they spoke to the Government through a council which was primarily concerned with the general practitioner. The association's constitution, though it may be a model of orthodox democracy, has scarcely favoured expression of minority opinion,<sup>2</sup> and that constitution would have to be changed considerably to make it acceptable to a group which is numerically rather small but professionally rather important. For the moment it seems as if the B.M.A.'s need to represent the specialist is greater than the specialist's need to be represented by the B.M.A.

In some of the new hospital regions, associations are spontaneously arising to represent hospital doctors; and last week in our correspondence columns

Dr. DUNCAN LEYS expressed the views of those who think that a council elected by these associations, and suitably supplemented, would be the most natural and satisfactory central organ of consultants and specialists. This would essentially be a new body, formed for its own new purpose; and the proposal has corresponding merits. But it also has corresponding defects. Dr. LEYS recognises the desirability of strengthening his central committee by bringing in nominees from the Royal Colleges, and he would be glad to see representatives of the British Medical Association on his committees both at the centre and in the regions. The outcome can be foretold. Large bodies such as the British Medical Association exercise an immense attractive force on smaller ones which enter their orbit, and unless the new organisation was determined to be independent, and provided itself with adequate funds and a secretariat, it would soon find itself making use of facilities offered by the large and efficient B.M.A. Indeed such facilities are already being offered to the regional associations.

The third proposal is less conventionally democratic in the sense that it pays less attention to numbers and is based more on representation of institutions. Unlike the others, it takes full account of the fact—well expressed by Dr. W. A. BOURNE<sup>3</sup>—that whereas on the whole the standards of general practice are set at the periphery those of specialist practice are set in the big hospital centres. Functionally rather than politically, the kind of body which would best represent specialists might, we have suggested,<sup>1</sup> be a central council composed of representatives of the Royal Colleges and the various specialist organisations, with a moderate number of representatives from the regions, appointed either by regional associations or by the associations of teaching and non-teaching hospital staffs. A body of this type—with one or two of its limbs unfortunately missing—met in London last week and decided to remain in being pending developments. If its constitution errs on the side of giving too much influence, through the colleges, to the teaching schools, this is partly perhaps because the B.M.A. scheme conspicuously gives too little; greater strength might easily be given to representation from the regions—thereby achieving a compromise with Dr. LEYS's plan. To those who are prepared to look ahead it is apparent, moreover, that abolition of the distinction between voluntary and municipal hospitals, and extension of postgraduate teaching, are bound to broaden further the counsels of the colleges, giving to provincial centres the influence appropriate to their achievements. With a national outlook in the colleges, and a regional outlook in the teaching hospitals, sectionalism must steadily diminish, and it is clear that a Council of Consultants and Specialists judiciously composed from the colleges and representative organisations in the manner we have indicated could present specialist opinion effectively. Its constitution might be criticised on the ground that it was only partially elective; but those who prefer a direct system of representation, whether through the B.M.A. or otherwise, should recognise the possibility that their elected committee might actually speak with less authority rather than more.

1. *Lancet*, May 8, p. 715.  
2. *Ibid.*, 1944, ii, 84.

3. *Ibid.*, June 12, p. 923.

While discussion continues on these three possible methods of devising a representative committee for specialists, it may be asked what relation this committee would bear to the largely professional body which the Spens Committee wishes to charge with the task of making "distinction awards," for which about a third of all specialists would qualify. Regarded as an agent of the Government in the distribution of remuneration under the National Health Service of this latter body would have functions distinct from those of the representative committee, which (when necessary) would be an agent of specialists against the Government. On the other hand, if any semi-official central body is set up, either for purposes of grading remuneration or of deciding the qualifications of a specialist, it must certainly keep continuously in touch with whatever committee or council is eventually accepted as representing the specialists.

### Surgery of the Heart

CARDIAC surgery has made tremendous strides in the last ten years, and since these advances have followed separate paths they must be attributed, at least partly, to the improvements in surgical technique as a whole. Today, thoracotomy is a safe procedure, as a result of the pioneer work of such surgeons as the late TUDOR EDWARDS. The special methods of anaesthesia required for these patients<sup>1</sup> have progressed equally rapidly, while preoperative and postoperative care, transfusion, oxygen therapy, chemotherapy, and—last but not least—penicillin have all contributed to reduce the risks of this new field of surgical endeavour.

The patent ductus arteriosus was first successfully ligated by GROSS<sup>2</sup> of Boston in 1939. As long ago as 1907 MONRO had suggested such an operation, and in 1938 STRIEDER<sup>3</sup> embarked on an attempt but had the misfortune to choose an unsuitable case. There are now many large series of successful closures of the patent ductus, and simple ligation has been supplemented by such manoeuvres as wrapping with 'Cellophane,'<sup>4</sup> injection of a sclerosing solution of glucose,<sup>5</sup> and later, complete division of the ductus. Although GROSS<sup>4</sup> in January, 1944, reported 14 consecutive operations for complete division of the ductus, most workers have found this modification unduly hazardous, and simple ligation remains the treatment of choice in most clinics. It was while performing a difficult closure of a patent ductus that CRAFOORD<sup>6</sup> found it necessary to clamp the aorta just distal to the subclavian artery for 27 minutes. He was astonished to find that the patient in no way suffered from the temporary occlusion and this led him to suppose that in coarctation of the aorta, where a very generous collateral circulation exists, he could excise the stenosed part of the vessel and perform a direct anastomosis of the open ends. This he successfully accomplished in October, 1944, and the operation has now passed into general usage. There is still some doubt whether all coarctations

should be operated on; some patients with the milder degrees of stenosis may have as long an expectation of life without intervention and should be spared the hazards of a major operation.

The commonest cause of cyanosis in congenital heart anomalies is the tetrad, or tetralogy, of Fallot, its four main features being stenosis of the pulmonary artery, dextroposition of the aorta so that it overrides the septum, an interventricular septal defect, and right ventricular hypertrophy. If a child with this condition survives it is a "blue baby"—cyanotic, with little or no exercise-tolerance, clubbed fingers and toes, and typically a preference for the squatting position. The degree of cyanosis varies with the type of lesion and is due to the shunt of venous blood through the septal defect and to the passage of blood directly from right ventricle into aorta, since the latter overrides the interventricular septum. From her wide clinical experience of the condition HELEN TAUSSIG has defined these salient features: the heart is of normal size with a basal systolic murmur and a clear second sound, the electrocardiogram shows right axis deviation, and radiography reveals a boot-shaped heart without the normal pulmonary conus. On screening there is a notable absence of the normal pulsations in the hilar regions of the lungs; if pulsation is present the case belongs to the Eisenmenger variety in which the pulmonary artery is not stenosed. To compensate for the low oxygen saturation of the blood a polycythæmia develops, the red-cell count being usually 6–10 million per c.mm. Following up experiments on dogs with arterial fistulae, in which he had anastomosed the pulmonary artery and vein after pneumonectomy,<sup>7</sup> BLALOCK began in 1945 to operate on patients with pulmonary stenosis, anastomosing the subclavian to a pulmonary artery.<sup>8</sup> The result was to return to the lungs a proportion of the poorly oxygenated blood from the systemic circulation, and this proved highly successful. The children treated gained a higher oxygen saturation of the circulating blood, lost much of their blueness, and could walk about and in some cases play games, while the blood picture slowly returned to normal. The operation was the outcome of inspired planning and exceptionally fine technique, and it is now being performed in clinics throughout the world. WILLIS POTTS<sup>9</sup> of Chicago tackled the stenosis differently, anastomosing the aorta to the pulmonary artery. He devised an ingenious clamp which only partially occluded the aortic lumen during the making of the fistula, and he has done 45 of these operations with only 4 deaths. This technique has also found favour in Melbourne, where 9 successful Potts anastomoses have lately been reported.<sup>10</sup>

Many patients with Fallot's tetralogy have very small pulmonary arteries, but in some the obstruction is the result of a remarkable stenosis of the pulmonary valves. Instead of three cusps which fold back into sinuses of Valsalva, there is an obstructing septum perforated by a tiny opening rather like a central nipple. HOLMES SELLORS describes in this issue how in December last year he widened this opening with

1. Rait-Smith, B., Ostlere, G. *Lancet*, May 1, p. 674.  
 2. Gross, R. E., Hubbard, J. P. *J. Amer. med. Ass.* 1939, 112, 729; *Ann. Surg.* 1939, 110, 321.  
 3. Graybiel, A., Strieder, J. W., Boyer, N. H. *Amer. Heart J.* 1938, 15, 621.  
 4. Gross, R. E. *Surg. Gynec. Obstet.* 1944, 78, 36.  
 5. Crafoord, C. *Acta chir. scand.* 1944, 91, 97.  
 6. Crafoord, C., Nylin, G. *J. thorac. Surg.* 1945, 14, 347.

7. Blalock, A. *Arch. Surg. Chicago*, 1946, 52, 247.  
 8. Blalock, A., Taussig, H. B. *J. Amer. med. Ass.* 1945, 128, 189.  
 9. Potts, W. J., Smith, S., Gibson, S. *Ibid.* 1946, 132, 627.  
 10. Potts, W. J., Gibson, S. *Ibid.* 1948, 137, 343.  
 11. Allen, M. N. *Med. J. Aust.* June 12, p. 729; Officer Brown, C. J. *Ibid.*, p. 731; Orton, R. H. *Ibid.*, p. 733.

a tenotomy knife introduced through the wall of the right ventricle; the operation was successful and the patient has largely been relieved of his cyanosis. Lately BROCK<sup>11</sup> has recorded 3 such operations performed this year, all of which relieved the cyanosis as satisfactorily as the Blalock operation, but unfortunately 2 were complicated by arterial embolism. He has designed a cardioscope carrying a guarded blade which he hopes will enable him to cut the valve under direct vision. An important step in division of the pulmonary valve is opening the pericardium, for this allows the surgeon to inspect and palpate the artery directly.

The surgical relief of pulmonary stenosis opens up the possibility of intracardiac surgery being applied to other valvular defects. Attempts have been made in the past to treat mitral stenosis by surgical methods, ELLIOTT CUTLER'S<sup>12</sup> work being the most successful, but they have been abandoned because of the high mortality. However, the recent work on congenital lesions has shown how some of the difficulties can be overcome, and it will certainly stimulate further attempts at valvulotomy. Defects of the interventricular septum should also be amenable to repair. An urgent question is how to maintain an adequate flow of oxygenated blood to the brain while such operations are being performed, for the present approach must perforce be rather hurried. The introduction of heparin has made it practicable to devise mechanical hearts which can be harnessed to the patient while his great vessels are occluded, and the technical problems involved are being studied. Intracardiac surgery is now ready for further advances, and, as BLALOCK and TAUSSIG, CRAFOORD and NYLIN, and others have brilliantly demonstrated, they are most likely to be achieved by the combined efforts of surgeon and physician.

### Influenza and the Human Herd

KNOWLEDGE of the viruses of influenza is steadily growing,<sup>13</sup> but, apart from the studies of SHOPE<sup>14</sup> on swine influenza little light has been thrown on the general problem of its epidemiology. Recent years have, it is true, provided evidence that influenza is a global phenomenon and therefore requires world-wide study. Yet long ago it was realised that the observation of "nature's experiments" was likely to be slow and laborious, and that an experimental approach subject to human control would produce quicker results. The non-contagious character of influenza virus infection in mice made it impossible to continue by this means the study of experimental epidemiology initiated by TOPLEY and his co-workers.<sup>15</sup> The study sponsored by the Rockefeller Foundation<sup>16</sup> indicated what might be learnt by the alternative method of observing events in a human microcosm. But the Yorkville study, based on a small rural community in New York State, lasted only two years and was not very informative, though it taught us something about the correlation between susceptibility to influenza and the content of antibodies in the serum.

In Great Britain, studies of influenza have chiefly been confined to the observation of communities such as schools during outbreaks, and the impermanence of such herds has prevented deductions being drawn concerning the hosts, as distinct from the viruses. The records of a country practitioner<sup>17</sup> from 1933 to 1946 have proved a new source of information which fills several gaps in our knowledge. PICKLES'S "herd," the cottagers of Wensleydale, has already provided valuable information on several infectious diseases.<sup>18</sup> His history of influenza in the same group of communities has now been analysed statistically and useful facts have emerged. First, the major waves of influenza—three of influenza A and the fourth of influenza B—experienced in Great Britain during the fourteen years are faithfully reproduced in miniature in one or other, or sometimes all of the villages of Wensleydale, illustrating how thoroughly these waves involve the population. Secondly, the attack-rate in individual villages severely affected by a particular outbreak of influenza exhibits a significant negative correlation with the attack-rate experienced in an outbreak four years later, but a positive correlation with one occurring seven years after the first wave. In the calculation of such correlations it has been assumed that the outbreaks in Wensleydale were caused by the viruses known to be responsible for simultaneous outbreaks in other parts of the country, for no laboratory tests were made in the Yorkshire villages. The conclusion drawn is that influenza A produces a significant herd immunity for four but not for seven years against homologous infection, and that it does not protect against influenza B occurring within two years.

These important deductions should encourage and stimulate attempts to prevent influenza. If immunity to influenza lasts only a few weeks, as direct experiments on human volunteers have seemed to indicate,<sup>19</sup> artificial immunisation must be relatively hopeless. But if the duration of immunity for a human herd is really as long as four years, possibly because herd immunity is far more complex than the summation of individual host resistances, then there is some hope for artificial immunisation. After all, it is the natural disease against which protection is desired; and if the problem created by the appearance of new antigenic races of the influenza viruses can be solved, the setback suffered by the exponents of immunisation<sup>20</sup> may be only temporary. The report by Dr. HELEN MELLANBY and her colleagues at the National Institute for Medical Research, which appears in this issue, illustrates the difficulties which vaccination trials have to face. By vaccinating whole groups, rather than only alternate individual cases, it was hoped to study the behaviour of an immunised herd at epidemic periods. The results, however, were disappointingly inconclusive, mainly because the influenza of 1947 was mild and comparatively scarce. Certainly the vaccines used did not produce any striking fall in incidence, and on these findings no-one would yet recommend the vaccination of whole communities.

11. Brock, R. C. *Brit. med. J.* June 12, p. 1121.  
 12. Cutler, E. C., Beck, C. S. *Arch. Surg. Chicago*, 1929, 18, 403.  
 13. Francis, T. jun. *Ann. Rev. Microbiol.* 1947, 1, 351.  
 14. Shope, R. E. *J. exp. Med.* 1941, 74, 41, 49.  
 15. Greenwood, M., Hill, A. B., Topley, W. W. C., Wilson, J. *Spec. Rep. Ser. med. Res. Coun., Lond.* no. 209, 1936.  
 16. Rickard, E. R., Lennette, E. H., Horsfall, F. L. *Publ. Hlth Rep., Wash.*, 1940, 55, 2146.

17. Pickles, W. N., Burnet, F. M., McArthur, N. *J. Hyg., Camb.* 1947, 48, 469.  
 18. Pickles, W. N. *Epidemiology in Country Practice*. Bristol, 1939.  
 19. Francis, T. jun., Pearson, H. E., Salk, J. E., Brown, P. N. *Amer. J. publ. Hlth*, 1944, 34, 317.  
 20. Francis, T. jun., Salk, J. E., Quilligan, J. J. *Ibid.*, 1947, 37, 1013.

## Functional Localisation in the Frontal Lobes

WE are privileged to live in an age of intellectual renaissance—doubting, questioning, and experimental. The atmosphere may not always be comfortable for *l'homme moyen sensuel*; but, so long as too much concentration of power in the hands of a few can be avoided, the climate is a healthy one for natural science. Certainly the neurologist can enjoy the stimulation of the fresh breezes, that are blowing through neurology and its ancillary disciplines just at present; and nowhere is the pursuit of knowledge more exciting than in the correlation of structure and function in those areas of the cerebral cortex traditionally termed "silent." Prof. JOHN F. FULTON, of Yale, in the first three of his William Withering lectures delivered at Birmingham from June 7 to 10, took up the tale of frontal-lobe function, a field in which the application of physiological research to practical medicine has been unusually rapid. It was in 1935 that he and JACOBSEN reported their findings on frontal-area ablation in the chimpanzee, and within a year MONIZ had published the encouraging results of some 20 cases of "frontal leucotomy" carried out, with his assistant LIMA, in the treatment of major psychoses. Since then, while clinicians have pursued the treatment with an enthusiasm that has sometimes outrun discretion, neurophysiologists have attempted to clarify and define localisation of function within the frontal lobe. In his first two lectures Professor FULTON described the rich rewards of this search.

As is the way with science, new facts have invalidated some old hypotheses but have given fresh significance to other half-forgotten observations. In this work two procedures have proved especially useful. The first is DUSSEY DE BARENNE's technique of "physiological neuronography": strychnine applied to one area of the brain fires off action-potentials in other parts in which nerve-fibres from the first area end, and the mapping of these action-potentials indicates the functional connexions of the strychninised part. The second is the analysis of changes in complex behaviour, both trained and spontaneous, which may follow limited cortical ablations in sub-human primates. No less valuable has been the attention paid by WYSS<sup>1</sup> and his colleagues to the exact type of electrical stimulus used to excite the cortex. For it appears that by varying the duration and frequency of the stimulating current quite different responses may be elicited from the same cortical points; and that, for a given response, both optimal stimulation and correct localisation are required.

Loose clinical terminology often uses "frontal" to mean the cortex anterior to the motor and premotor areas (Brodmann's areas 4, 6, and 8); but anatomically the frontal lobe extends right back to the rolandic fissure, and some of the evidence FULTON marshalled seems to demand a change in textbook views even of these old-established motor areas. The theory, for instance, that the pyramidal tracts arise mainly from Betz cells in the precentral gyrus is supported neither by LASSEK's<sup>2</sup> histological work (he finds an average of only 34,000 Betz cells in each cerebral hemisphere in man but over 1,000,000 separate fibres in each medullary pyramid) nor by WOOLSEY and CHANG's<sup>2</sup> results

of antidromic stimulation of the pyramids in monkeys, where antidromic potentials were found widely dispersed not only throughout the precentral motor cortex but also in the parietal lobes. It seems that the large-fibre element of the pyramidal tract is the only one restricted to an origin from area 4, while the more numerous small fibres drain a much bigger watershed. Equally, the clinical concept of pyramidal spasticity requires modification, for experimental evidence from pyramidal section in primates suggests a flaccid paresis as the outcome of such a lesion. Interestingly enough, the picture is similar to that produced by a limited area-4 cortical ablation, despite the fact that pyramidal section must interrupt fibres derived from a far more extensive area than this—some of them certainly stemming from area 6, whose ablation, when combined with that of area 4, can be relied on to produce spasticity. It seems probable that spasticity is linked at cortical level to lesions of the specific inhibitory or suppressor areas described by HINES and DUSSEY DE BARENNE and his colleagues<sup>3</sup> in the cortex of subhuman primates. But these areas have not yet been clearly defined in man.

Even more fundamental than this work, however, is the unequivocal evidence brought forward for detailed autonomic representation in the cortex. Appropriate stimulation in animals of points in area 6 will produce vasomotor changes, while from area 8 pupillary changes, lacrimation, and ex- or en-ophthalmos may occur. Changes in motility and secretion of the gut may also follow activation of area 8. Moreover, there seems to be topographical linkage of autonomic and somatic representation at cortical level—stimulation of a given point producing either motor or autonomic response, according to the rate and duration of the stimulus. An anatomical basis for this seems to be established in the connexions, demonstrated by LE GROS CLARK<sup>4</sup> and others, between frontal areas and thalamic nuclei which relay to the hypothalamus, and also by the finding of WARD and McCULLOCH<sup>5</sup> of a direct two-way pathway from orbital frontal areas to hypothalamus. These facts presumably bear on the characteristics both of so-called psychosomatic disorders and of some that are regarded as purely psychogenic.

When we move forward to the "prefrontal" region, or (as FULTON prefers to call it) the "frontal areas," recent advances in experimental work are still considerable. Since FULTON and JACOBSEN's early report, efforts have been made to define more accurately the source of the behaviour changes they noted. Two areas especially have been studied, the anterior cingulate gyrus (area 24) and the orbital-frontal areas 13 and 14. WARD<sup>2</sup> has noted a change in behaviour in the monkey after localised ablation of area 24, and this change is so striking and constant that he suggests that such ablation must be the beneficial part of frontal leucotomy in man. With removal of area 13, there is loss of peripheral vasomotor tone and sustained hypermotility; while area-14 lesions, less thoroughly investigated, are recorded as giving rise to sham rage.

The anatomical and physiological foundation seems already to have been laid for the attempt at localisation of function within the frontal areas of the human

1. Wyss, O. A. M. *Amer. J. Physiol.* 1937, 120, 42.  
2. *Res. Publ. Ass. nerv. ment. Dis.* 1948, 27.

3. Bucy, P. O. (editor). *Precentral Motor Cortex*. Chicago, 1944.  
4. Le Gros Clark, W. E. *Lancet*, 1948, 1, 353.  
5. Ward, A. A., McCulloch, W. S. *J. Neurophysiol.* 1947, 10, 309.

cortex that RYLANDER and RITCHIE RUSSELL<sup>6</sup> asked for at the International Conference of Physicians last September. But this can only come from the clinicians—neurosurgeons, neurologists, and psychiatrists—and, with a few exceptions, clinical studies have so far made a poor showing against the physiological approach. The difficulties of the clinical problem are admittedly great: treatment is often of supreme importance to relatives and patients, and results are hard to assess, since our present range of psychometric tests is inadequate, and opportunities for detailed study of changes in everyday behaviour are few. Moreover, as HEBB<sup>7</sup> has pointed out, lack of accurate anatomical information in those who survive, and the possibility that, when neoplastic or fibrous tissue has to be left in situ, the symptoms after operation are basically irritative, make the interpretation of such material doubly difficult. Nevertheless, further knowledge can

be gained, and three developments are worth encouraging. Firstly, all frontal-lobe material should be preserved for full histological and anatomical study post mortem. Secondly, pre- and post-operative study, especially of autonomic function, should be undertaken in every leucotomy case, however unpromising the material appears. And thirdly, we should try to replace blunderbuss leucotomy by a more accurate and limited cortical excision. Experimental work already points the way to the locality of such limited excisions, and PENFIELD<sup>2</sup> and POOL seem to be following it. There is no doubt that operations at present practised on the frontal lobe sometimes produce a profound change in personality, aside from their therapeutic effect, and we are scarcely measuring up to our responsibility unless we do everything we can to make our therapy benefit the patient without harming his personality.

## Annotations

### TWO QUALITIES OF SERVICE?

CORRESPONDENTS of the *Times* have been discussing the fact that practitioners joining the National Health Service will be entitled to charge fees to patients not on their lists. The principle behind this arrangement was clearly stated in the white-paper of 1944: "the new service will be there for everyone who wants it . . . but if anyone prefers not to use it, or likes to make private arrangements outside the service, he must be at liberty to do so." This liberty might have been limited by forbidding doctors in the service to treat any patient privately, but the consequent sharp division of the profession into public and private doctors would have interfered with the patient's freedom of choice, would have caused overlapping of services, and in some areas would have proved impracticable. Accordingly, in its wisdom, Parliament accepted the alternative of allowing private practice to every doctor, whether in the service or not.

All this should have been common knowledge, but obviously is not. And the simultaneous launching of the two social-security schemes has added to public confusion. Through pamphlet, press, and radio two Ministries are urging people to complete and forward different forms of enrolment—one for National Insurance, which for large sections of the population is compulsory, and the other for the National Health Service, which is available to everybody but need not be used by anyone who prefers to do without it. No wonder so many patients are muddled; and the permutations of misconception encountered daily by general practitioners are amazing. To allay the doubts of patients who want to remain private patients, but who are afraid of losing other privileges if they do so, the British Medical Association produced the pamphlet which led to the *Times* correspondence. For the first time many people have become aware that "even if a particular doctor has entered the health service he is still entitled to hold out the choice to patients—either to register with him for free medical service or to stay as a private patient and pay for his services and medicine."<sup>8</sup> Naturally the layman asks, and the doctor echoes, "what will the patient gain by choosing the second course?" It must not be a higher standard of medical care; and in justice to all parties let us say at once that hardly anybody suggests that it should. What in fact he generally hopes for is amenities lacking in the public service. He is willing to pay extra

if it enables him to avoid the effort and loss of time involved in attending the doctor's surgery—particularly when that attendance is merely to obtain a further certificate or a prescription permitting continuance of treatment already advised.

There are few doctors who would not agree with the white-paper that the care of patients under public arrangements must not "suffer in quality or quantity by reason either of private commitments or other public engagements. Nor must anyone have reason to believe that he can obtain more skilled treatment by obtaining it privately than by seeking it within the new service." And yet all are apprehensive of such an influx of additional work after July 5 as may make it hard to provide the unhurried service to which the private patient may in the past have been accustomed. The question is well posed by Dr. Beryl Harding<sup>9</sup> when she says: "But now that all patients are entitled to 'free' medical attention, when all will need fresh prescriptions for each bottle of medicine, when all will be demanding certificates which will bring them generous medical benefits during any incapacity, where will be the time for careful, thorough medical practice?" Her own solution seems to be to stay outside the service, and devote her time solely to private patients; but though this may enable her personally to go on giving a leisured and satisfying service to those of her patients who can still afford it, it does not solve the national problem of providing all the attention that is needed for all who will now be able to claim it. As Mr. R. W. G. Mackay, M.P., points out,<sup>10</sup> this very expectation of extra clinical work and the demands it will make on the doctor's time makes it all the less feasible for him to be "ready to stop and go off to meet somebody's comfort and convenience at any time, so long as that somebody pays a fee." Yet it seems to many that this is just what he will be expected to do, and may have to attempt.

Had it been possible to begin the new service with health centres, where the doctor, given every assistance, could use his professional time to the best advantage, things might have started differently. We must press for the earliest possible development of such centres if for no other reason than that they are the only likely means of fulfilling the promise of the white-paper that the new service "will be so designed that it can be looked upon as the normal method by which people get all the advice and help which they want." Meanwhile, until centres have been proved, and widely established, doctors will have to accept and to bear to the best of their ability the extra burdens placed on them. Foretelling that the profession now "will seek to make the

6. Russell, W. R. *Lancet*, 1948, 1, 356.

7. Hebb, G. O. *Arch. Neurol. Psychiat.* 1946, 54, 6.

8. *Times*, June 12.

9. *Ibid.*, June 19.

10. *Ibid.*, June 18.

new public service the best which is humanly possible under present circumstances," Dr. Dain<sup>11</sup> adds, with a sincerity that none will wish to betray :

"The individual citizen will be free to decide whether he will take advantage of the public service in whole or in part. But this will not mean that there will be two qualities of medical service rendered to the public. Only the best is good enough for the public service, and we shall do our utmost to provide it."

### STRAWBERRIES AS FOOD

THE strawberry, now in full picking season, consists almost entirely of water (88.9%), sugar (6.2%), and unavailable carbohydrate (2.2%), but it is a good, though variable, source of vitamin C. Investigation by the U.S. Department of Agriculture<sup>12</sup> last year showed that the ascorbic-acid content averaged about 60 mg. per 100 g., though for some varieties the figure was 75-80 mg. An average helping (a quarter of a pound) would therefore fulfil the daily requirements of an adult. Strawberries grown in the shade contained less vitamin C than those exposed to normal sunlight, and ripening on the plant produced the best content. Some say that it is as a source of water, rather than of vitamin C that birds eat the fruit, and gardeners of this school advocate bowls of water as protection.

### POSTURE AND PRESSURE

IT is more than fifty years since Leonard<sup>13</sup> Hill demonstrated that four-legged mammals would die from cerebral anæmia if kept upright for a few days. Does the development of man from quadruped to biped partly explain why he is so subject to hypertension? Wald and his associates<sup>14</sup> showed that when the normal person stands up the necessary adjustment of blood-pressure takes place rapidly—largely within the first minute—and it is now generally agreed that orthostatic hypotension is due to inadequate functioning of the sympathetic nervous system. The effect of posture on the blood-pressure, however, has not hitherto been fully investigated in a large series of normal people. Currens<sup>15</sup> has now studied this effect in 500 men and 500 women between the ages of 18 and 55 years, their average age being 33.2 years. The blood-pressure was recorded in both the recumbent and the erect position, and all the necessary precautions appear to have been taken to ensure that the readings were comparable. The upper limits of normality were set at 150/90 mm. Hg.

In this investigation diastolic hypertension, lying and standing, was observed in 5% of the men and 2.8% of the women; lying only, it was found in 0.8% of the men and 0.2% of the women; while standing only, it was found in 6.4% of the men and 1.8% of the women. In other words, nearly twice as many men as women had a diastolic hypertension, but when it occurred only in the erect position it was almost four times as common in men as in women. Taking a change of 4 mm. Hg in the diastolic pressure and 10 mm. Hg in the systolic pressure as significant, the diastolic pressure rose in 48% and fell in only 12% when the subject stood up. For the systolic pressure the findings were reversed: it rose in 3.7% and fell in 33% on standing. No appreciable change with posture was noted in the diastolic pressure in 40% of cases and in the systolic pressure in 63.5%. On standing the pulse-rate rose in 95% of the entire group, the average increase being 13.2 per min. in both men and women.

The question arises whether these findings provide a useful (it would certainly be a simple) test for assessing

the probability of a person developing hypertension in later life. A careful follow-up over a long period would be necessary to determine this. (Incidentally, how much more we would know about the natural history of hypertension if systematic follow-ups had been instituted thirty years ago!) If, as has been estimated, man spends half to two-thirds of his life in the erect or semi-erect position, the effect of this on those of us with an imperfect autonomic nervous system may be considerable. Certainly the findings of Currens emphasise the importance of rest in the recumbent position in the treatment of hypertensive patients.

### A YEAR'S WORK

THE Lister Institute's report for 1947-48 summarises a useful year's work. For example, in the field of bacteriology, Mrs. E. Klieneberger-Nobel, D.Sc., has devised methods for the demonstration of bacterial capsules and slime envelopes, and mucoid substances surrounding and embedding capsulated organisms. In hæmatology, Miss Margaret Mackay, Ph.D., and Dr. W. d'A. Maycock have found that ether-extracted plasma which had caused reactions in human beings contained dangerously high concentrations of sodium citrate. Maycock has also confirmed that dextran, a plasma substitute favourably reported on in Sweden, is non-toxic and non-antigenic; and it is to be tried clinically. Mr. W. T. J. Morgan, D.Sc., has obtained evidence that the so-called O-substance is not a product of the O gene but is a primary or basic substance, heterogenetic in character, which is present in most erythrocytes; to it the name "H-substance" has been given. At the same time a substance has been detected in red-cell extracts which has the serological properties of a true O-substance, a product of the O gene; such a substance has often been held to be absent from the erythrocyte surface owing to the recessive character of the O gene. In an investigation of sera from patients with differing types of jaundice, Mr. R. A. Kekwick, D.Sc., and Dr. C. H. Gray have discovered that a small but definite fraction of the bilirubin migrates with the  $\alpha$ -globulin in addition to the bulk of the bilirubin which migrates with the albumin; and the binding of the bilirubin by differing plasma proteins is apparently unrelated to the nature of the direct van den Bergh reaction.

The institute continues to house research units of the Medical Research Council and the Ministry of Health. The M.R.C.'s National Collection of Type Cultures, now confined to cultures of medical and veterinary interest, consists of about 3000 strains of bacteria; and about 200 new strains have been added during the year. The Ministry of Health's blood-group reference laboratory, in conjunction with the M.R.C.'s blood products unit and the National Institute for Medical Research, has completed the first stages in the preparation of international standard anti-A and anti-B grouping sera.

### METHODS OF RAT DESTRUCTION

IN the last seven months of 1945, 75 cases of plague were diagnosed in Malta, and Barnett<sup>1</sup> has described the methods used to eradicate the rats carrying the infection. The island has a population density three times that of England, and conditions are favourable for the multiplication of rats, particularly in the towns and urban districts. From June, 1945, to June, 1946, out of 22,902 rats examined 659 were *Rattus rattus* and the remainder *R. norvegicus* (the brown rat). Of this total 20 rats, including 15 *R. norvegicus*, were found to be infected with *Pasteurella pestis*. Systematic rat destruction began at the end of August, 1945. The standard rat poisons—zinc phosphide, red squill, arsenious oxide, and the more recent addition, 'Antu' ( $\alpha$ -naphthyl-

11. *Ibid.*, June 18.

12. Ezell, B. D., Darrow, G. M., Wilcox, M. S., Scott, D. H. *Food Res.* 1947, 12, 510.

13. Hill, L. *Amer. J. Physiol.* 1895, 18, 15.

14. Wald, H., Guernsey, M., Scott, F. H. *Amer. Heart J.*, 1937, 14, 318.

15. Currens, J. H. *Ibid.*, 1948, 35, 646.

1. Barnett, S. A. *J. Hyg., Camb.* 1948, 46, 10.



thiourea)<sup>2</sup>—were used. Plain bait was laid for four or five nights, and poisoned bait on the fifth or sixth night. A fortnight after poisoning a different plain bait was laid to test for residual infestation. Where takes of this bait were observed, baiting was continued again for four or five nights, after which a new poison was added. Cleaning and proofing of buildings were also carried out as far as possible. All farms and built-up areas, including the sewers, were systematically treated. When the control measures started, nearly all the bait was taken; six to seventeen months after treatment only 11.6% of 362 test baits had been touched three days after setting. The reduction of the rat population was accompanied by a decrease in the incidence of plague and of flea-borne typhus.

According to O'Connor<sup>3</sup> the rodenticides in common use all have the disadvantage that they are rapidly acting and produce acute symptoms of poisoning even when eaten in sublethal doses. This produces the troublesome condition of "bait shyness" in the rat colony and makes 100% eradication difficult, even when prebaiting is used. He has therefore been studying the use as a rat-poison of dicoumarol, the active principle of spoiled sweet clover, the eating of which has long been known to cause a fatal hæmorrhagic disease in cattle. The average fatal dose for albino rats weighing 250 g. is 28 mg. if taken over fourteen days, whereas 30 mg. given over three days is not lethal. This necessity for a cumulative effect greatly reduces the danger of accidental poisoning. Dogs weighing 8–10 kg. survive single doses of 1 g. per kg. of body-weight and daily doses of 50 mg. administered over ten to fourteen days without developing spontaneous hæmorrhages.

For initial field trials dicoumarol was added to bait at the rate of 200 mg. per lb. dry weight. Prebaiting has proved to be unnecessary, for the poison is entirely acceptable to the wild rat. The most satisfactory technique so far evolved has been to ensure that the rodents have constant and free access to the poisoned bait. The amounts eaten gradually become less as the rats become weaker and die, but the baits should be left for some time to poison the migratory rats, which are the source of reinfestation. O'Connor claims that complete clearance can be achieved with dicoumarol more economically than by other methods.

#### TRICHINIASIS FROM THE WALRUS?

In May, 1947, the State Serum Institute in Copenhagen received an s.o.s. from Greenland where a mysterious epidemic had broken out. Some paratyphoid-like disease was suspected; trichiniasis, be it noted, had hitherto never been detected in Greenland. The institute sent Dr. N. B. Thorborg to investigate the epidemic on the spot, and he and his associates<sup>4</sup> have now reported on their findings. There were about 300 cases with 33 deaths between the beginning of January and the middle of May, 1947. The disease usually began gradually, with progressive lassitude, headache, pains in the limbs and trunk, and slight fever. In some cases there was diarrhoea, a sore throat, or some other catarrhal condition. Sometimes the onset was acute, with shivering and high fever, vomiting, and diarrhoea. The temperature rose gradually to a considerable height and fell by lysis, usually remaining at 99°F or so for a week or two before it fell to normal. Slight cases were afebrile. In about 80% there was a rash, sometimes scarlatiniform, sometimes urticarial. There was œdema of the face or limbs or of the whole body, and pain in various muscles was almost constant. About half the patients presented gastro-intestinal symptoms. The cardiovascular system was often profoundly involved, and the many cases of

sudden death were evidently due to myocardial failure. The severity varied widely in different parts of Greenland, the case-mortality being nil in some areas and up to 37% in one area. The age of the patients ranged from 2 to 63 years, and all of them were natives of Greenland. Transmission from man to man was not demonstrable.

The diagnosis of trichiniasis was confirmed by eosinophilia, by reactions to cutaneous tests with a trichina antigen, by serological tests of samples of blood sent to Denmark, and by the demonstration of numerous and already encapsuled trichina larvæ in the muscles of a patient who had died after 3 months' illness. The pig could not be incriminated at all and only 32 of the patients had eaten dog within a month of the onset of the disease. It was noticed, however, that in most places the epidemic synchronised with the walrus season and the consumption of walrus meat. Trichinæ were not found in any of the samples of walrus meat examined, but the circumstantial evidence against it was very strong. The white whale (*Delphinapterus leucas*) also came under suspicion.

#### SUCCESSFUL ANTI-V.D. CAMPAIGN IN THE U.S. ARMY

LAST year it was reported<sup>1</sup> that the incidence of venereal disease in the United States Army was lower than at any time since the end of the late war, and the fall was then attributed mainly to more stringent regulations and partly to a new emphasis on the soldier's personal standards of morality. During 1947 the decrease was "phenomenal," amounting to 40% for the army as a whole and more than 50% for troops stationed at home, and the morality campaign is now said to be given most credit for the improvement.

The new attitude to venereal disease is based on an investigation made in 1946 at the peak of incidence, which suggested that the best method of getting results would be by "an intelligent appeal to the higher moral sense of the individual." For this purpose the U.S. general staff established a department of the Army Venereal Diseases Control Council, including as members the Army Director of Personnel and Administration, the Surgeon-General, and the chief chaplain. Subsidiary councils were established at all military installations. Educational talks and conferences laid stress on the moral reasons for good conduct rather than on the importance of prophylactic measures. The army withdrew instructional films and talks used for propaganda against venereal diseases and substituted a film entitled *The Miracle of Living*, described as the first of a series, which illustrates the rewards of good conduct as well as the potential effects of venereal diseases on future health and happiness.

This technique is "new" only in comparison with military methods of the past. The idea that the ills of humanity can be prevented or cured by the observance of high moral standards is inherent in all religious teaching; but the U.S. Army is to be congratulated on supporting hallowed beliefs which are commonly derided by young people of today. Nevertheless, education in moral standards given to those undergoing military service is unlikely to be effective unless it strengthens or reawakens conceptions acquired in earlier life. Other factors may well have profoundly influenced the incidence of venereal diseases during this period, such as the return to peace-time conditions, with less movement, less stress, less separation, and less infection in the civilian populations. At the same time an increase in "activity programmes and planned entertainments" must have had a contributory effect. Nobody would deny the importance of moral and religious instruction at all ages, but it is not clear that it has achieved all that is claimed for it in this particular instance.

2. See *Lancet*, 1947, i, 492, 878.

3. O'Connor, J. A. *Research*, 1948, i, 334.

4. Thorborg, N. B., Tullinius, S., Roth, H. *Ugeskr. Læg.* May 20, 1948.

1. *Lancet*, 1947, ii, 455.

## Special Articles

MONOPOLIES  
OF MEDICAL AND DENTAL SUPPLIES

PROF. HERMANN LEVY

THE progress of science and technology has had a remarkable effect on the relation of medicine to industry. Medicine has to a large extent become dependent on the services of manufacturers who specialise in medical goods, of which pharmaceuticals and medical appliances are the most conspicuous. Changes in medical treatment in the direction of a greater use of complex organic chemicals and biological products are constantly widening the sphere of the manufacturing chemist (Pharmaceutical Society of Great Britain 1939); the Ministry of Pensions (1945), reporting on artificial limbs, has provided significant references to the growing specialisation of appliances and designs all produced by large-scale manufacturing industry which, in the last 25 years, has shown a decided trend towards concentration into ever bigger and fewer establishments. A decidedly modern development is that of electrically operated hearing-aids (Medical Research Council 1947), which are also mainly produced by a few large manufacturing firms.

All these developments are responsible for new and closer links between medicine and industry. Medicine, however, is not merely interested in this group of industries from a technical point of view—i.e., in industry's efficiency to deliver the goods in accordance with the scientific progress of inventions and discoveries. The services rendered by industry in those respects and in furthering and assisting research are valuable; but the medical profession will do well to watch the economic implications of the growing importance of large-scale industry as the provider of medical goods. The profession wants to see the results of scientific progress applied as fully and as cheaply as possible, to the relief of patients. This is the ideal of "socialisation" (Levy 1944a) of medicine—not to be confounded with nationalisation—and it is for that reason that we have always found the medical profession on the side of a social diffusion of the achievements of medicine.

Medicine cannot disinterest itself from certain aspects of the purely economic organisation of the industries which provide these medical goods, particularly when it becomes evident that their production is becoming more and more concentrated in a few hands with monopolist or quasi-monopolist character. The Ministry of Pensions (1945) emphasised the fact that "the vast majority of the artificial legs made in this country" at the outbreak of the war were made by two firms, and that the "tendency in regard to arms has been the same." In the National Health Service, it now appears, all artificial limbs given to patients will be supplied through the Ministry of Pensions, and "orders will be placed only with their present sole contractors at Roehampton, who till now have supplied all Service cases" (Desoutter 1948).

In his book on cartels Mr. Wendell Berge, former assistant attorney-general of the United States, devotes a whole chapter to the problem of monopoly in medicines; among others he mentions insulin. Most of the sufferers require one or more daily injections:

"They are dependent for their very lives on an adequate supply of the drug at a reasonable price. Yet a monopoly group exploiting its privileged position took advantage of the industry and of the public to impose arbitrary prices and unreasonable conditions of distribution. Wholesalers, distributors, and retailers were compelled to adhere to the edicts of the monopoly group under the threat that, if they did not do so, no insulin would be sold to them.

"Few effects of monopoly have been more insidious than the consequences of cartel control over many areas in the drug and medical field" (Berge 1946).

## DENTAL SUPPLIES

A field of medical goods to which attention should be paid, when the potential dangers of monopolist organisation are discussed, is that of dental supplies. Dental

science is another branch of medicine in which important technical innovations have taken place and have led to the manufacturing of supplies on a large scale and in large industrial units. The national advantage of good dentistry, using as far as possible the best available means of treatment, is indisputable and has certainly not escaped the attention of those who planned the National Health Service. Careful and specialised treatment, using fully the diagnostic possibilities following the advances in radiography, should to a large extent do away with unscrupulous extraction. If this will require many more dentists it will also require a great extension of the manufacturing facilities for dental supplies, and will make it even more necessary that these should be provided as cheaply as possible. As the Ministry of Pensions (1945) says, a Government department "is bound, by its duty to the taxpayer, to be satisfied that it is getting proper value for what it spends."

Viewed from this angle, an official report on dental supplies just published in Canada is highly significant (Commissioner, Combines Investigation Act, 1947). After emphasising the importance of dental supplies to national health it prophesies a consistent increase in the demand for dental goods, "as the needs of the public for dental services are met to a more adequate extent."

Such goods cover a wide field. The "commodities" are precious metals, artificial teeth, equipment, and many sundries. "Equipment" includes the principal apparatus found in a dentist's consulting-room, such as dental chairs, units, X-ray apparatus, sterilisers, and cabinets. "Sundry merchandise" consists chiefly of supplies which are consumed in single treatments, such as filling materials, anaesthetics, and denture materials, but also includes small instruments and apparatus which have a continued use. In making many of these goods there has been great progress. For instance, in recent years vulcanised rubber and other materials which used to form the denture base for sets of artificial teeth have been largely superseded by plastics of methyl methacrylate (widely known under the name of 'Plexiglas').

The Canadian report is primarily concerned with an alleged combine in the manufacture and sale of dental supplies in Canada. But it shows that throughout the world a feature of the manufacture of dental goods is the predominance of a few leading manufacturers associated together and with domestic dealers in various trade associations. This organisation is so strong that independent dealers in Canada are unable to secure supplies from many manufacturers in other countries, either because these do not sell in the Canadian market or because they deal only with association members.

British firms and trade associations play an important part in this world-wide combination.

The famous Amalgamated Dental Company Ltd., in London, the dominant British dental firm, began in 1905 as Claudius Ash and Co., and has subsidiaries in the United States and Canada. The Canadian subsidiary was in 1922 merged with another firm to form the Ash-Temple Co., in which Claudius Ash Sons (Canada) has continued to hold a stock interest. In 1924 Amalgamated adopted its present name after a merger of the Ash business with that of another undertaking; it also owns almost all the shares of the Western Dental Manufacturing Co., another British manufacturer. It owns a substantial amount of the common stock of Dentists' Supply of New York, and distributes this company's products in Great Britain, Europe, and Australia, and together with Dentists' Supply of New York it owns substantial stock in a big German firm. Amalgamated entertains reciprocal arrangements, for the distribution of their respective supplies in specified countries, with the important American firm of L. D. Caulk, of Milford, Delaware, which has a subsidiary in Canada.

The intertwining of international interests in dental supplies with a strong nucleus in Britain becomes obvious. But perhaps even more important than national amalgamation of single firms into trust-like organisations is the formation of trade associations with a definite policy concerning prices and trade practices. Prof. Ervin Hexner recently stated (Hexner 1945) that reliable sources list among collective marketing controls the international cartel of dental supplies, which has members in Germany, England, France, Liechtenstein, Austria,

Switzerland, Czechoslovakia, and the United States. It was established in 1923 for an indefinite period. International cartels are in general based on the pre-existence of strong national trade associations, and so it is in the case of dental supplies. Such associations exist in Britain, U.S.A., and Canada.

In Britain we have the Association of Dental Manufacturers and Traders, a trade association embracing both representatives of the industry and of the distributive trade. The Canadian report concludes that "the maintenance of fixed prices was a rule of the association" and that "provisions were made for complaints regarding infringement of the rules, and penalties were laid down in the form of stop lists, fines, and expulsion of offending members." This corresponds to what we know about many other trade associations in Britain (Levy 1944b).

The British pattern of price maintenance and restrictive dealing shows, as the Canadian report emphasises, a pronounced similarity to the practices developed by trade associations in dental goods in the U.S.A. and Canada.

The Canadian report states that the "margins over wholesale prices agreed upon by members of the Canadian Dental Association have been shown to be substantial and to have been fixed regardless of the efficiency of the individual distributor," a conclusion which may be of interest to our recently appointed Board of Trade committee on resale price maintenance. The report also states that conclusive evidence was produced that "there was a complete suppression of price competition among dental dealers throughout the trade in Canada." We do not know yet what the position regarding this is in Britain, though the Canadian report seems to be in no doubt about the restrictive structure of the manufacture and distribution of dental supplies in this country.

#### COST TO THE PUBLIC.

Yet another important factor emerges from the Canadian investigation. It is sometimes argued by the interested parties that prices of individual dental goods used in particular operations have an infinitesimal effect on the fees charged by a dentist to his patient. An example was given to Canadian investigators of the cost of the alloy used in filling one tooth, which might amount to only three cents, where the dentist might charge as his fee for the operation an amount ranging from 1-5 dollars. The report rightly argues that such splitting-up of the price factor, the analysis of a single product and a single operation in isolation, gives a mistaken idea of the importance of dental supplies. It is estimated that the yearly sales of dental goods in Canada are something like 5 million dollars, and that this would amount to some 12% of the total cost of dental services to the public. This result is in accordance with the testimony of professional witnesses that such costs were substantial, and corresponds to an estimate of one of them that they range from 10 to 15% of gross income. The same witnesses agreed that the cost of supplies and equipment would have its effect on fees charged to the public.

The danger to dentistry which may develop when trusts and trade associations try to eliminate competition by restrictive practices, price fixing, and price maintenance is therefore very real; and the problem is one which also concerns medicine.

The danger of private monopolies in medical supplies is not removed when the State becomes the sole or principal purchaser and when it prefers to place its order with only a few large concerns. It is disquieting to hear that, in consequence of the decision that under the National Health Service artificial limbs will be supplied by only two firms, one flourishing firm has recently given notice to 20,000 customers, both at home and abroad, that it is discontinuing this branch of its work (Seddon 1948). In view of possible developments of this kind care should be taken that full public scrutiny of monopolistic practices and prices charged is provided where Government departments deal with a few dominant firms—a point which should be considered in discussions on the Monopoly (Inquiry and Control) Bill now before Parliament.

References at foot of next column

## ANCILLARY PROFESSIONS AND THE ACT

BODIES representing dentists, opticians, and pharmacists have lately expressed their views on participation in the National Health Service.

**Dentists.**—The decision by the British Dental Association's council not to recommend members to join the service<sup>1</sup> has been endorsed by members who met in Birmingham last Saturday and decided by an overwhelming majority not to join the service. After a meeting of the association's representative board on Sunday a statement<sup>2</sup> was issued, saying:

"... The members are profoundly dissatisfied at the complete refusal of the Minister to grant any of the association's basic principles in connexion with the health service, at the hurried and incomplete way in which the remuneration negotiations were carried through, and the lack of security in the present position by which a whole-salaried service can be introduced by regulation alone. The letter to be sent to members will point out that although the Acts have been passed, the National Health Service cannot be successful without the willing co-operation of the profession. The council of the association is satisfied that the majority of the profession will not willingly go into the service."

The Incorporated Dental Society and the Public Dental Service Association announced this week\* that members would be left to decide individually whether to enter the service. These bodies, which are stated to represent 6100 dentists, deny that there is anything in the Act, the regulations, or the scale of fees which would justify their recommending members not to join.

Last week Sir William Douglas, permanent secretary of the Ministry of Health, summarised the conclusions reached by the Minister at his meeting, on June 7, with the Dental Consultative Committee. They are as follows:

1. Provision will be made in the amending Bill to meet the expenses of local dental committees by empowering the executive council, at the request of the local dental committee, to make appropriate deductions from the remuneration due to dentists.

2. Provision will also be made for the dental members of the tribunal to be selected from a panel of members of the same profession with experience in various types of practice.

3. The Bill will include a provision enabling dental practitioners to enjoy similar opportunities to those offered to medical practitioners for treating private patients in hospitals.

4. There should be the greatest possible measure of clinical freedom; but "the arrangements proposed are already based on that principle and allow a far greater degree of freedom than was permitted under the Insurance Scheme. In the new service all normal and necessary conservative work may be completed without prior approval, as well as extractions which do not necessitate the supply of dentures and all emergency treatment."

The Denture Service Association, representing the interests of about 500 denture repair services employing some 1500 technicians, is seeking amendment of the Act to enable them to undertake repairs qualifying for payment under the National Health Service. By the Act, all such repairs must pass through the hands of dentists.

1. See *Lancet*, June 19, p. 972.

2. *Times*, June 21.

3. *Daily Telegraph*, June 22.

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**Opticians.**—After two years of negotiations with the Ministry of Health, the joint emergency committee representing the opticians has advised that the Ministry's terms, while not entirely adequate, form a basis on which opticians can enter the supplementary ophthalmic scheme of the service.<sup>4</sup> The Minister's decision that the public must first obtain a doctor's certificate before attending an optician for the first time is accepted under protest. The terms of remuneration are considered inadequate, but it is agreed that they should be given a fair trial. Opticians have asked the Minister to introduce legislation for the registration of opticians; and the committee accepts the Minister's proposal to set up a departmental committee to advise whether this would be to the public advantage. Negotiations for the permanent scheme which is eventually to replace the supplementary scheme are still proceeding.

**Pharmacists.**—The National Pharmaceutical Union has announced that with few exceptions pharmacists will accept service under the Act.<sup>5</sup> In a statement the union said that the Ministry's offer gives chemists a considerable improvement on what they receive for dispensing National Health Insurance prescriptions; the new terms are comparable with the payment they have received for private dispensing.

## LONDON TEACHING HOSPITALS

### BOARDS OF GOVERNORS

THE Minister of Health has now constituted a board of governors for each of the 26 London teaching hospitals. The boards include members appointed on the nomination of the University of London, the metropolitan regional hospital boards, and medical teaching staffs of the hospitals.

Roughly a third of the members will retire each year, and the following list shows the names printed in three groups: (a) those retiring in March, 1950; (b) those retiring in March, 1951; (c) those retiring in March, 1952. (The chairmen will hold office till March, 1951.) The names of the medical members are shown in bold type. The boards of the provincial teaching hospitals were published in our last issue (p. 958).

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(b) **Horace Evans**, F.R.C.P.; **George Graham**, F.R.C.P.; Miss K. M. Halpin, O.B.E.; R. C. Hammett; **C. F. Harris**, F.R.C.P.; **J. B. Hume**, F.R.C.S.; Lord Huntingfield, K.C.M.G.; H. K. E. Ostle; Mrs. A. Louise Reeve; Alderman C. H. Simmons, J.P.

(c) Ronald Armstrong-Jones; J. J. G. Bishop; **F. C. Capps**, F.R.C.S.; Prof. **R. V. Christie**, F.R.C.P.; W. M. L. Escombe, D.S.O.; Lady Ismay; D. C. F. Lowson; A. Maxwell Nelson-Barrett; Prof. **J. Paterson Ross**, F.R.C.S.

#### LONDON HOSPITAL

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(b) A. G. Allen; F. T. Baldock, J.P.; Prof. **J. D. Boyd**, M.D.; **W. Russell Brain**, F.R.C.P.; H. W. Butler, M.P., J.P.; W. C. Hale, O.B.E., M.C.; H. R. Hobson, D.S.O.; J. Jacobs; Sir Albert Stern, K.B.E., C.M.G.; W. Stone.

(c) Hubert Ashton; **A. E. Clark-Kennedy**, F.R.C.P.; Richard Coppock, C.B.E.; Prof. **V. W. Dix**, F.R.C.S.; Eustace Hoare; B. A. Salmon; **J. Stanley Thomas**, M.R.C.S., J.P.; Prof. **Clifford Wilson**, D.M.

4. *Ibid.*, June 18.

5. *Ibid.*, June 19.

#### ROYAL FREE HOSPITAL

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(c) Hon. Terence Eden, M.C.; Sir Malcolm Trustram Eve, M.C., K.C.; Sir Claude Frankau, O.B.E., D.S.O., F.R.C.S.; Hugh Gainsborough, F.R.C.P.; Hugh Gordon, M.C., F.R.C.P.; Gilbert Mallett, M.C.; W. E. Meade; D. Stark Murray, M.B.; Mrs. Margaret Walkden, J.P.

## WESTMINSTER HOSPITAL

*Chairman*: Lord Nathan.

(a) A. N. H. Baines; C. J. Gavey, M.D.; Mrs. R. Marguerite High; T. J. Millin, F.R.C.S.; P. H. Mitchiner, C.B., C.B.E., F.R.C.S.; Lord Remnant; E. C. de Rougemont; Sir Harry Vanderpant; E. H. Welch.

(b) A. Lawrence Abel, F.R.C.S.; Jack Fitch, J.P.; H. E. Harding, F.R.C.S.; Mrs. Jane Lesser; A. G. Linfield; G. T. Mullally, M.C., F.R.C.S.; Prof. R. J. Pulvertaft, O.B.E., F.R.C.P.; R. B. C. Ryal; Sir Geoffrey Shakespeare; Alderman Thomas Wheeler, J.P.

(c) H. M. Clowes, D.S.O.; J. A. Dewar; Hon. Mrs. Leslie Gamage; A. J. Gayner; Sir Louis Greig, K.B.E., C.V.O.; H. P. R. Hoare; G. H. Macnab, F.R.C.S.; Alderman Rev. Harcourt Samuel; Sir Arnold Stott, K.B.E., F.R.C.P.; F. A. Yarrow.

## ST. MARY'S HOSPITAL

*Chairman*: A. G. de Rothschild.

(a) Mrs. Betty T. Compton; Richard Doll, M.B.C.P.; V. H. Ellis, F.R.C.S.; Sir Alexander Fleming, F.R.C.P., F.R.S.; I. M. Gluckstein; A. H. Lee; Lord McGowan, K.B.E.; Prof. W. D. Newcomb, F.R.C.P.; Miss Esther Rickards, F.R.C.S.; Hugh Lionel Smedley.

(b) Denis Brinton, F.R.C.P.; V. Zachary Cope, F.R.C.S.; Alderman Mrs. Ena Daniels; H. Floyd; Prof. Frank Goldby, M.D.; G. B. Mitchell-Heggs, F.R.C.P.; S. L. Simpson, F.R.C.P.; H. E. Verey, D.S.O.; Sir Adrian Carton de Wiart, V.C., K.B.E., C.M.G., D.S.O.; E. Rohan Williams, F.R.C.P.

(c) Sir Lionel Cohen; Joel Green, L.R.C.P.I.; T. C. Hunt, F.R.C.P.; E. E. Lawley; Frederick Lawrence, J.P.; A. E. Porritt, O.B.E., F.R.C.S.; H. N. Sporborg, C.M.G.; L. D. Thomson.

## GUY'S HOSPITAL

*Chairman*: Lord Cunliffe.

(a) S. B. Askew; Alderman R. H. Burslem, J.P.; Sir Herbert Eason, C.B., C.M.G., M.S.; E. V. Evans, O.B.E.; J. A. Gillison, M.B.; Prof. T. B. Johnston, C.B.E., M.D.; K. I. Julian; Henry Levitt; Prof. W. R. Spurrell, F.R.C.S.; F. S. Warner, M.B.C.S., F.D.S.

(b) Hedley Atkins, F.R.C.S.; Mrs. E. G. M. Barlas; Mrs. Iris Brook; C. J. Conway, K.C.; Sir Patrick Cooper; W. Kelsey Fry, O.B.E., M.C., M.R.C.S.; Alderman S. C. C. Harris; F. J. O. Prescott; Sir Charles Symonds, K.B.E., F.R.C.P.; L. B. Wimple.

(c) E. R. Boland, C.B.E., F.R.C.P.; Miss M. M. C. Burrows; R. J. Butterworth; C. A. Chadwyck-Healey, O.B.E.; Sir John Conybeare, K.B.E., M.C., F.R.C.P.; A. B. Kennedy; W. J. de W. Mullens, D.S.O.; A. Talbot Rogers, M.B.; E. G. Slesinger, O.B.E., F.R.C.S.

## KING'S COLLEGE HOSPITAL

*Chairman*: Marquess of Normanby, M.B.E.

(a) Ralph Cocker; E. R. Cyples; Terence East, F.R.C.P.; Arthur Hague-Winterbotham; G. Hart; H. L. Kendell; Hon. Mrs. Charles Tufton, O.B.E.; H. L. C. Wood, F.R.C.S.; S. J. Worsley, D.S.O., M.C.

(b) T. H. Barr; P. R. Colville; L. M. E. Dent, D.S.O.; M. V. Ely; Viscountess Hambleden; Hon. Mrs. Sylvia Henley; Wilfrid Sheldon, F.R.C.P.; J. R. H. Turton, F.R.C.S.; Sir Cecil Wakeley, K.B.E., C.B., F.R.C.S.

(c) M. V. Courage; H. C. Edwards, O.B.E., F.R.C.S.; Sir William Gilliat, C.V.O., F.R.C.O.G.; R. A. Hornby; J. B. Hunter, C.B.E., M.C., F.R.C.S.; R. D. Lawrence, F.R.C.P.; Mrs. Mary Ormerod; J. H. Peel, F.R.C.S.; J. T. Pyne.

## ST. THOMAS'S HOSPITAL

*Chairman*: Hon. A. J. P. Howard, C.V.O., M.P.

(a) G. H. Bateman, F.R.C.S.; J. Bishop Harman, F.R.C.P.; Sir John Laithwaite, K.C.M.G., K.C.I.E., C.S.I.; Alderman Harry Regan, J.P.; R. J. Sainsbury; H. Stephens; Mrs. D. A. Thomas; N. E. Waterfield, F.R.C.S.; S. W. Whiffen; J. M. Wyatt, F.R.C.O.G.

(b) W. G. R. Boys, O.B.E.; Sir Brunel Cohen; E. F. Crundwell; J. R. Dickinson, F.R.C.S.; A. N. Drury, O.B.E., M.D., F.R.S.; F. H. Elliott, J.P.; Prof. T. Pomfret Kilner, O.B.E., F.R.C.S.; A. H. Montgomery, O.B.E.; R. H. O. B. Robinson, F.R.C.S.; L. H. Simmons.

(c) Prof. W. G. Barnard, F.R.C.P.; J. St. C. Elkington, F.R.C.P.; L. T. Greensmith; Arthur Hague-Winterbotham; A. G. Linfield, O.B.E., J.P.; Lindsay Mackie; Prof. George Perkins, M.C., F.R.C.S.; J. Forest Smith, F.R.C.P.; C. H. Vernon.

## HAMMERSMITH, WEST LONDON, AND ST. MARK'S HOSPITALS

*Chairman*: Somerville Hastings, F.R.C.S., M.P.

(a) E. G. Anthony; Prof. J. H. Dible, F.R.C.P.; Dame Katherine Jones; Horace Joules, F.R.C.P.; Prof. E. J. King, D.S.C.; O. V. Lloyd-Davies, F.R.C.S.; Miss Amy Sayle, M.B.E.; C. D. Simpson, J.P.; Prof. James Young, D.S.O., F.R.C.O.G.

(b) G. F. Grant Batchelor, M.C., F.R.C.S.; Sir Allen Daley, F.R.C.P.; His Honour Judge J. Norman Daynes, K.C.; C. E. Dukes, M.D.; Sir Francis Fraser, F.R.C.P.; Geoffrey Huddle; T. H. Jones; Robert Poots, M.B.; A. E. Tyler.

(c) R. P. Chambers; Hon. John Fremantle; D. H. Mason, O.B.E.; Prof. John McMichael, F.R.C.P.; C. E. Newman, F.R.C.P.; T. E. Parker, J.P.; Richard Sargood, J.P., M.P.; Maurice Shaw, F.R.C.P.

## HOSPITAL FOR SICK CHILDREN

*Chairman*: T. H. Bischoff, M.C.

(a) Hon. Margaret Bigge; I. A. B. Cathie, M.D.; Miss E. V. Eckhard; G. H. Macnab, F.R.C.S.; Lady Thomas; T. M. Wechsler, M.B.E.

(b) Sir Allen Daley, F.R.C.P.; T. Twistington Higgins, O.B.E., F.R.C.S.; C. H. Hodge, J.P.; P. K. Hodgson, C.M.G., C.V.O., O.B.E.; G. B. Jeffery; Eric Lloyd, F.R.C.S.; Prof. T. H. Marshall, C.M.G.; A. E. Middleton; Bernard Schlesinger, F.R.C.P.

(c) James Crooks, F.R.C.S.; L. Farrer-Brown, J.P.; C. A. Lucas; Miss R. L. Mitchell; Sir Frederick Pile, G.O.B., D.S.O., M.C.; Wilfrid Sheldon, F.R.C.P.; W. G. Wyllie, F.R.C.P.

## NATIONAL HOSPITALS FOR NERVOUS DISEASES

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(a) J. B. Hunter, C.B.E., M.C., F.R.C.S.; Hon. Mrs. Richard Lyttelton; J. Purdon Martin, F.R.C.P.; P. M. Hugh; Countess of Rothes; Julian Taylor, O.B.E., F.R.C.S.; W. H. Taylor.

(b) D. N. Black; W. Russell Brain, F.R.C.P.; E. A. Carmichael, C.B.E., F.R.C.P.; Hon. Mrs. Waley Cohen; Sir Archibald Gray, C.B.E., F.R.C.P.; A. C. Longland, K.C.; P. D. Power.

(c) Denis Brinton, F.R.C.P.; Miss Kathleen Cooper-Abbs; Prof. D. Hughes-Parry; Lord Rayleigh; J. K. Vaughan-Morgan; F. M. R. Walshe, O.B.E., F.R.C.P.

## ROYAL NATIONAL THROAT, NOSE, AND EAR HOSPITAL

*Chairman*: E. E. Taylor.

(a) A. G. Farr; L. D. Lewis; Frank Ormerod, F.R.C.S.; J. R. Rosselli; Mrs. Mabel Rye.

(b) Nehemiah Asherson, F.R.C.S.; F. R. Eiloart; G. H. Howells, F.R.C.S.; W. Humphrey; W. S. McKenzie, F.R.C.S.; A. W. Scott.

(c) S. A. Beards, M.S.; C. Gill-Carey, F.R.C.S.E.; F. N. Hornsby; T. H. Lawley; Mrs. O. A. MacIver; Mrs. Clare Turquet.

## MOORFIELDS, WESTMINSTER, AND CENTRAL EYE HOSPITAL

*Chairman*: Rt. Hon. the Lord Luke, J.P.

(a) N. E. Behrens; J. D. M. Cardell, F.R.C.S.; Mrs. Elsie Franklin; Frank Law, F.R.C.S.; Sir Harold Morris, M.B.E., K.C.; Miss Spenser-Wilkinson; Sir John Stainton, K.B.E., K.C.

(b) E. P. Carter, O.B.E.; F. le Gros Clark; Eric Walter Hall, J.P.; Mrs. A. L. Hollingsworth, J.P.; S. P. Meadows, F.R.C.P.; George Parker-Jervis; Earl of Rothes.

(c) Jonathan Backhouse; **R. C. Davenport**, F.R.C.S.; Sir **Stewart Duke-Elder**, K.C.V.O., F.R.C.S.; Hon. Arthur Gore; **F. W. Lascelles**; **T. Keith Lyle**, F.R.C.S.; Alderman **C. H. Simmons**.

## BETHLEM AND MAUDSLEY HOSPITALS

*Chairman*: G. E. Coke.

(a) **W. J. Bourne**; Mrs. **Eva Hubback**, J.P.; Prof. **A. J. Lewis**, F.R.C.P.; Alderman **T. E. Morris**, J.P.; **T. A. Munro**, M.D.; Prof. **Samuel Nevin**, F.R.C.P.; Alderman **Sir Frederick Wells**; **G. P. Wright**.

(b) **Macdonald Critchley**, F.R.C.P.; **C. G. Dickson**; Miss **D. Sutherland Gill**; Mrs. **H. Girling**, O.B.E., J.P.; **W. G. H. Luckett**, J.P.; Mrs. **N. C. Runge**, O.B.E.; **E. C. Sherwood**.

(c) Prof. **R. V. Christie**, F.R.C.P.; **J. G. Hamilton**, M.D.; **W. G. Masefield**, M.R.C.S., J.P.; Prof. **John McMichael**, F.R.C.P.; **J. F. Murphy**, L.R.C.P.I.; Miss **Doris Odum**, M.R.C.S.; Mrs. **Mary Ormerod**; **G. E. H. Palmer**.

## ST. JOHN'S HOSPITAL FOR DISEASES OF THE SKIN

*Chairman*: **J. A. M. Ellison-Macartney**.

(a) **F. Ray Bettley**, F.R.C.P.; Sir **Archibald Gray**, C.B.E., F.R.C.P.; **Hal Gutteridge**; **Humphrey Whitbread**.

(b) **A. Franklin**; Sir **Samuel Gluckstein**; **G. B. Mitchell-Heggs**, O.B.E., F.R.C.P.; **J. B. Poynder**; **S. Cochrane Shanks**, F.R.C.P.

(c) **Henry Corsi**, F.R.C.S.; **A. H. Montgomery**; **Edward Snowden**, J.P.; **J. E. M. Wigley**, F.R.C.P.

## HOSPITALS FOR DISEASES OF THE CHEST

*Chairman*: Sir **Robert Young**, C.B.E., F.R.C.P.

(a) Alderman **A. E. Allaway**, J.P.; **Lord Blackford**; Mrs. **M. G. Burton**; **J. H. Cooke**; Sir **Bennett Hance**, K.C.I.E., O.B.E., M.D.; Sir **Henry Macnaghten**; **A. J. Newman**; Sir **Hugh Turnbull**, K.C.V.O., K.B.E.; **F. H. Young**, O.B.E., F.R.C.P.

(b) **R. C. Brock**, F.R.C.S.; Mrs. **Ann Bromley**, J.P.; Mrs. **Sarah Candy**; Sir **John Gilmour**; **V. A. Grantham**; **J. C. Hoyle**, F.R.C.P.; **J. L. Livingstone**, F.R.C.P.; **Clarence Rutter**, M.R.C.S.; Sir **Harold Scott**, K.C.M.G., F.R.C.P.; **Vernon Thompson**, F.R.C.S.

(c) **Lord Doverdale**; Hon. **Esmé Glyn**, O.B.E.; **F. R. G. Heaf**, F.R.C.P.; **L. B. Prince**; **J. G. Scadding**, F.R.C.P.; **Joseph Smart**, M.D.; **Ben Smith**; **Widdrington Stafford**; **C. Price Thomas**, F.R.C.S.

## ROYAL NATIONAL ORTHOPÆDIC HOSPITAL

*Chairman*: **Louis Fleischmann**, C.B.E.

(a) **E. P. Brockman**, F.R.C.S.; **F. B. Coates**; **A. T. Fripp**, F.R.C.P.; **Howard Kerr**, C.M.G., C.V.O., O.B.E.; **William Nichols**, J.P.

(b) Sir **Henry Floyd**, C.B., C.B.E.; **F. Campbell Golding**, F.R.C.P.; Prof. **George Perkins**, M.C., F.R.C.S.; **H. C. Willig**; Miss **M. Joan Wood**.

(c) **H. Jackson Burrows**, F.R.C.S.; **R. Y. Paton**, F.R.C.S.; **S. G. Rowlandson**, M.B.E.; **Harold Sutcliffe**, M.P.; **Lady Wakehurst**.

## NATIONAL HEART HOSPITAL

*Chairman*: **M. V. Ely**.

(a) **R. C. Brock**, F.R.C.S.; **J. M. H. Campbell**, O.B.E., F.R.C.P.; **Earl of Cromer**, G.C.B., G.C.I.E., G.C.V.O.; **J. Simons**; **L. H. Watts**.

(b) **J. M. F. Cohen**; **T. F. Cotton**, F.R.C.P.; Sir **Francis Fraser**, F.R.C.P.; **J. M. Oakey**, M.C., J.P.; **B. T. Parsons-Smith**, F.R.C.P.

(c) Sir **William Arbuthnot Lane**; Sir **John Parkinson**, F.R.C.P.; **Paul Wood**, O.B.E., F.R.C.P.

## ST. PETER'S AND ST. PAUL'S HOSPITALS

*Chairman*: **L. E. D. Bevan**.

(a) **A. W. Badenoch**, F.R.C.S.; **A. R. R. Martin**; **C. H. Mills**, M.R.C.S.; Sir **Hewitt Skinner**; **H. M. Tobin**; **R. Ogier Ward**, D.S.O., O.B.E., M.C., F.R.C.S.

(b) **A. M. Farquhar**; Sir **Bertram Galer**, J.P.; **A. R. C. Higham**, F.R.C.S.; **I. G. Mitchell-Innes**; **G. Williams**; **H. P. Winsbury-White**, F.R.C.S.

(c) **F. J. F. Barrington**, F.R.C.S.; **A. R. G. Hudson**, O.B.E.; **E. D. Jefferiss Mathews**, O.B.E.; **Rev. E. R. Moore**; **Clifford Morson**, O.B.E., F.R.C.S.; **Miss Rosina Whyatt**.

## ROYAL CANCER HOSPITAL

*Chairman*: Sir **Giffard Martel**.

(a) **A. Lawrence Abel**, F.R.C.S.; Alderman **A. E. Allaway**; Prof. **R. G. D. Allen**, O.B.E.; **D. E. W. Gibb**; Sir **Kenneth Wigram**, G.C.B., C.S.I., C.B.E., D.S.O.; **W. G. Wilsher**; **F. Griffiths Woollard**, J.P.

(b) Prof. **Ian Aird**, F.R.C.S.; **A. Chester Beatty**; **P. E. Thompson Hancock**, F.R.C.P.; **G. L. Jacob**; Prof. **W. V. Mayneord**; Mrs. **Noel Patrik**; **G. C. Stanley**; **C. M. Vallentin**, M.C.

(c) **Lord Ashcombe**; **G. Koch de Gooreynd**, O.B.E.; Prof. **Alexander Haddow**, M.D.; **J. B. Hunter**, C.B.E., M.C., F.R.C.S.; **S. L. Lyons**; Mrs. **Murray-Graham**; Prof. **D. W. Smithers**, M.D.

## QUEEN CHARLOTTE'S AND CHELSEA HOSPITALS

*Chairman*: Sir **Frederick Minter**.

(a) **Frank Cook**, F.R.C.S.; Hon. Mrs. **Eliot Hodgkin**; Mrs. **A. Margaret King**, J.P.; **Desmond Reid**; Mrs. **Norah C. Runge**, O.B.E.; **J. Montagu Wyatt**, F.R.C.O.G.; Prof. **James Young**, D.S.O., F.R.C.O.G.

(b) **H. G. E. Arthure**, F.R.C.S.; Miss **Joan Bourne**; **Aubrey Goodwin**, O.B.E., F.R.C.O.G.; **Viscountess Jowitt**; **E. Musgrove**; **C. E. Newman**, F.R.C.P.; **A. McL. Niven**, J.P.; **Lady Ogilvie**; **Goodman Whiffen**.

(c) **A. C. H. Bell**, F.R.C.O.G.; **Lord Bingham**; Alderman Mrs. **Olive A. F. Davis**; **A. J. Espley**, O.B.E.; Hon. Mrs. **Angela Murray**; **J. Senior**; **C. L. Woolveridge**.

## EASTMAN DENTAL CLINIC

*Chairman*: Sir **Frank Newnes**.

(a) Miss **Rosamond Caseley**; Sir **Percy Everett**; Prof. **W. E. Herbert**, M.R.C.S.; Miss **E. N. Morton**; **W. H. Stevenson**.

(b) **Clarence Endicott**; **W. Kelsey Fry**, C.B.E., M.C., M.R.C.S.; **B. M. Lindsay Fynn**; **A. C. McLeod**; **G. Meekcooms**; **William Ritchie Young**.

(c) **F. J. Ballard**; **A. C. Deverell**; Mrs. **Dorothy Holman**; **A. D. Page**; Hon. **P. M. Samuel**, M.C.

## MEDICAL RECRUITS

THE Central Medical War Committee has decided that, in order to maintain the supply of general-duty medical officers, junior graduates shall be called up, during the second half of this year, after completion of the first six months in a hospital post.<sup>1</sup> The effect of this ruling on the training of future specialists is causing anxiety among the authorities at medical schools, one of whom has written to us about the implications at his own school. Of the junior resident posts there, three-quarters are graded as A and the remainder as A or B2, and the arrangements are designed to allow a small number of graduates to hold in succession junior appointments as house-physician and house-surgeon, or to hold a mid-wifery appointment after one of the others. The man who, after a year's observation, is still thought to show promise is appointed to a B1 post and given further training. This scheme, our correspondent says, is killed by the new procedure. "It would seem that in order to overcome a temporary difficulty, the authorities have by a sweeping regulation increased their difficulties for the future, for they are stopping the flow of potential trained specialists who would mature in a year or two." A second difficulty of which he complains is that since men are now confined to a single A appointment before call-up, they naturally prefer that this should be as either general house-physician or general house-surgeon; and it is now hard to get applicants for junior appointments in special departments.

1. See *Lancet*, June 12, p. 930; *Ibid.* June 19, p. 971.

## Disabilities

### 7. EPILEPSY

EPILEPSY is defined in the dictionary as the "falling sickness." I do not propose to enter into an academic discussion concerning types, characteristics, and causation of such seizures; I will tell quite simply what happens if I have a fit.

It starts with a peculiar sensation in my chest, but before I can do anything about it I am unconscious. I know and feel nothing. On recovery, I have a feeling of extraordinary well-being: wherever I happen to be lying, whether on a couch, the floor, or even the roadside, it is as if I were lying on the most comfortable bed. I may hear voices asking if someone has injured herself and I wonder of whom they are talking. If I notice someone looking down at me with evident concern, I wonder at the anxiety shown. After a few seconds, I am completely awake; I find that I am lying on the floor, remember the aura and know that I must have had another fit. I feel myself gingerly to make sure that I'm whole, get up, and that is all.

That is my version of the event, but what do spectators think? Perhaps I have been talking to them a few moments previously, I utter a cry and fall to the floor. My arms and legs jerk convulsively, my lips are covered with saliva, and my breathing is stertorous. After a very short interval these movements cease and I lie still, but my face remains pale and my eyes are open and appear vacant. It is a shock to whoever is present; they feel baffled and helpless. They wish to help, but there is little to be done: the interval during which I lie inert seems interminable, and because there is nothing much they can do their imagination becomes active. The person with me wonders what would have happened if the fit had occurred a few moments earlier when I might have been with a patient, or an hour later when I might have been alighting from a bus in a busy street, and determines that I must not run such risks in future.

These two opposing viewpoints magnify the difficulties which we epileptics have to overcome. There must be a compromise between the epileptic, who regards an attack as a "bolt from the blue," a rather unreal hazard; and the non-epileptic, who dislikes these dramatic happenings and regards them as an ever-present source of danger.

\* \* \*

I started to have fits at the age of 30. It is easy to describe one's physical and emotional reaction to a single fit, but the mental attitude adopted by an epileptic is not easy to define. Diagnosis of a chronic ailment is rarely made in a flash, so that one has often accepted the physical conditions before the "label" is attached. For about a year I must have had nocturnal attacks at intervals of 2-3 months: after each of these I awoke with a headache and a bitten tongue, and an attack of vomiting followed; I had no suspicion of the underlying cause. Intermittently, during the daytime, I had the symptom which I recognise now as an aura, and at times a more disturbing sensation, as if I had received an electric shock to the base of my skull. The culmination was a daytime fit, which was not recognised by those who saw it but which gave me the clue to these strange events. I then sought medical advice. Fortunately the doctor whom I consulted was sympathetic and advised me to carry on as long as possible, and to keep my own counsel.

When I knew that I was an epileptic, my first reaction was one of surprise: I had thought of this as a terrible complaint and was amazed to find it entailed very little physical discomfort. Its social significance was not brought home to me for some years. I continued with

my work as district-nurse-midwife. It was war-time, and even in country areas we were too busy to worry needlessly. After five years the strain of repeated night calls for midwifery proved too great, and fits occurred during the day. These could not be hidden, so adjustments had to be made. Because I had a good record, and because nurses were in demand, I was allowed to continue, but only in a casualty department among people who were not in the strict sense of the word "sick people."

I did not take kindly to this ultimatum, perhaps because of the manner in which it was issued. For the first time I realised something of the barrier which exists between the epileptic and the non-epileptic. There was an implication that there was no future in nursing for me, and that I had been guilty of a grave misdemeanour in having hidden my handicap. Although, in my new post, I met with kindness and consideration from the medical officers under whom I worked, I cannot describe the mental anguish which I suffered. It is better to forget this period; it was dominated by feelings of frustration, guilt, fear, and loneliness. For two years I was "unstable," but then I began to adopt a more reasonable attitude. I realised that if as an epileptic one cannot do the work of one's choice one must make the best of the work one is allowed to do, and interest in it will develop.

Besides making adjustments to the work one can reasonably be allowed to do one must learn to live with people who do not want to have the embarrassment of an epileptic thrust on them in their leisure hours. To do my job I must live away from home. I find the best way of managing is to take a furnished room and be independent of outside help. It is often wiser to keep one's secret, and to move to other rooms if trouble arises with the landlady; although sometimes an unexpectedly helpful attitude is shown. Household tasks—cooking, cleaning, mending, and shopping—occupy several evenings usefully and happily. An occasional meal in a restaurant, a visit to a cinema or theatre, provide diversion. The natural anxiety which my parents felt for my safety had to be allayed. My own powers of persuasion proved inadequate, but they agreed with my views more readily after reading some of the booklets published by the American League Against Epilepsy.

The solution of such problems is an individual matter, but epileptics who have met with much social frustration would welcome the advice of a social worker. I realise that the rather placid life which appeals to me, a woman of 40, would not satisfy an adolescent. I have talked to many epileptics, some of them young men and women on the threshold of life, eager for companionship and adventure. I have been impressed with their good sense, and their desire to help each other. Perhaps the social problem could be solved by the formation of an association for epileptics; such an association would help us to learn more about each other, and would teach us that we face a common difficulty. It would serve an excellent purpose if it became the channel through which the simple truth about the condition could be made known to the general public.

\* \* \*

Some of the ideas which I have held have helped me; some have proved fallacious. One should not generalise from a single instance, but an analysis of some of my hopes, doubts, and fears may be useful to others. The conviction that an attack would never occur when I was actually doing a job has been my safeguard. It has proved true. Daytime attacks have invariably come on when I have been trying to do two things at once—I may have been awaiting the arrival of a patient and worrying over a private matter such as the illness of a relative or a love affair not progressing well. It would be interesting to verify this from the experience

## In England Now

of others. Investigation might embrace not only the frequency and the time of day at which attacks occur but what the person was actually doing, and his state of mind at the time. Considering the insecurity of employment of many epileptics, it is likely that anxiety is ever-present in their minds, preventing proper concentration.

Medication is the responsibility of the physician, and its purpose is too seldom understood by us patients. The physician who will devote time to discussing it, and will emphasise that a more hopeful prognosis is possible with the aid of modern drugs, will gain the intelligent coöperation of his patient, without which the optimum dose and drug will not readily be found. We epileptics know that many of our fellows are in the wards of mental hospitals; we know that the drugs used are also given to neurotics, hence the fear that the tablets are only "dope," and that we may some day be inpatients. It cannot be said too often that, with modern medication, the outlook is more hopeful, that the number of fits will decrease, and that age as well as medication improves the chance of stabilisation.

Since fits are not unpleasant to the sufferer the fuss which the onlooker makes appears to us unreasonable. But we do shock their æsthetic senses. We would gladly hide away for a time and emerge with the fit over, but the peculiar nature of the disease rules out such a course. We can only reiterate that we do not suffer during attacks, and if our fellows will allow us to lead normal lives these embarrassing events will occur less and less often.

Although a fit is not unpleasant, the aura which precedes it is: it is a sensation which cannot be described, and will persist after fits have been "controlled." There must be many individual manifestations of the symptom. I have learned from experience that there are variations in its intensity—a violent aura will be followed immediately by a fit; a milder one may occur several times a day, for two or three days, without an aftermath. One never feels completely confident on such days, but the repetition of this cycle over many months without harmful effect dispels some of the alarm originally caused by this strange phenomenon.

In short, we epileptics are ordinary people to whom occasionally something "strange" happens. We do not want to make a fuss about it, and we do not want other people to do so. If we could find a method whereby the public could be educated on this subject; if, too, we could tell those in charge of industry the plain facts about the ailment and convince them that potential manpower and womanpower is running to waste, so that they would employ epileptics with confidence, perhaps making a minor adjustment in working conditions to suit each individual case, most of our difficulties would be solved. Perhaps the medical profession will lead us in this matter and help us to form an association, so that we can establish a realistic and rational attitude to epilepsy in the public mind and help ourselves to a fuller life.

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"... this passion for equality is felt far more strongly—or at least is practised far more assiduously—in Great Britain than anywhere else in the world. There may be countries where there is less inequality of money incomes—even after tax—than there is in Great Britain. But it is safe to say that there is none where there is less inequality in the real conditions of life. There is probably no country in the world today—certainly not Russia—where the food or the clothes that the rich can buy differ so little from the food or the clothes that the poor can buy as they do in Great Britain. . . . Nevertheless . . . it is still necessary to ask whether the community can afford the economic cost. . . . It is impossible for an Englishman to visit a country like Belgium or Switzerland without reaching the conclusion that a willingness to tolerate inequality . . . pays large economic dividends."—*Economist*, June 5, p. 915.

*A Running Commentary by Peripatetic Correspondents*

There is in England now a regular snowfall of white cards, which is quite in order; but there is also a plague of bell-ringing (telephone and other), not because the cards are being left, but because patients need the utmost reassurance that filling them up is in no way prejudicial to the status quo before they will ever touch the cards. The burden of their song is "as long as it's you, doctor." I have never seen such a demonstration of the futility of impersonal good will compared with the power of the familiar and the personal in swaying public opinion. Once convinced that "this paper" is only Authority's latest whim, and that the doctor's work will somehow be made easier by humouring it, patients will go to the length of possessing themselves of it gingerly and completing the form. Any mention of free blood-counts or barium meals would terrify them out of all coherence—and, as I want them as literate and unflustered as possible for the moment, I have given up packing as much accurate information into them as they will conveniently hold, and substituted a soothing technique of indiscriminate reassurance.

I say "unflustered" advisedly. Given two cards with 20.548 written under "date of birth," is it up to me, or is it for the executive council to discover that one patient is a lady of 83 who "didn't understand properly," and the other a day-old baby whose parents were apparently in a fit state to give correct data?

\* \* \*

To visit Sweden at the end of May is to enjoy a second spring—to see again lilac and laburnum, apple and chestnut in full bloom. There is nothing of dull reiteration about this second flowering, for it is seen against a backcloth of forest and rock, great waterways, painted villas, and gleaming ships. Each spring brings to the Stockholmer a true renaissance, a rebirth of body and spirit, for he then emerges from the dark winter to rejoice in the sun and the sea. The lakeside villas are opened up, the freshly painted boats are launched, and the people of Sweden become, until the autumn, riders to the sea. The schools close for three months in the summer, but in May, even if the children can be persuaded to come to school, work is a formality, for both teachers and pupils share this access of vitality, this vernal ebullition, which demands its expression in the open-air.

The Stockholmers' gaiety owes nothing to Strindberg, who must have written his plays in November, but it shares a quality of infectiousness with the temper of the happy islanders of Capri, and a visiting party of English and Irish pædiatricians recently found themselves caught up in this strange and welcome exhilaration. If the conduct of these staid physicians was less scandalous than that of the naughty bishop in *South Wind*, yet they too for five days lived in Arcadia (as guests of the Swedish Medical Association); they too dined and danced in the great halls of the Castle in Uppsala, escorting their partners along wide and noble stairways; they too made a gargantuan escape from austerity (waving, it is true, a few perfunctory coupons); and they too walked in the garden of Linneus, gazed enchanted at the matchless beauty of the Blue Hall in the Stadthus, were dwarfed by the majesty of the great brick arches of the Gothenburg Art Gallery, and for two blessed hours returned to the symmetry and order of the eighteenth century in the gardens and pavilions of a manor house at Beatelund. All this delight was no more than the hospitable decoration of their working days.

Sweden has long been distinguished for the excellence of its pædiatrics, and at a time when in our country it was merely the enthusiasm of a handful of physicians there was already in Sweden a mature organisation of general hospitals and special departments devoted to the care of children. Rapid developments in pædiatrics have occurred in Great Britain in the last twenty years, but it is not surprising to see that we still have much to learn from Sweden. There is, for example, a much closer integration of the preventive and curative services, so that the public-health pædiatrician comes easily into the pædiatric hospital and conference, and, though



enjoying recognition as expert in his own field, he looks to the Professor of Child Medicine as his natural and esteemed consultant. This makes not only for better relations but also for better planning, an example of which is the B.C.G. campaign in which Professor Wallgren has taken the leading part.

Social medicine and child psychiatry have also been integrated with equal facility into the existing structure. Poverty appears to be non-existent, and here the Swedes share with the Swiss the distinction of being the wisest (and the most fortunate) democracy in Europe. Social medicine in Sweden hardly concerns itself with poverty and malnutrition, but there are many other social problems with which it is occupied. Their scientific approach to social questions is illustrated by their handling of road accidents. The Swede dislikes noise, so motorists may use their klaxons only to prevent an otherwise inevitable accident. The car-driver involved in an accident has his blood-alcohol taken, and if it is above 100 mg. per 100 ml. (said to be the result of two schnapps rapidly imbibed) he goes to prison for a month. For an experimental year no-one was allowed to smoke while driving a car, but when the road accidents showed no diminution smoking while driving was again permitted. "Don't think—try" is accepted as a guiding principle in the Swedish body politic.

It is perhaps for this reason, too, that child-guidance has found an easy and untroubled entry into Swedish hospitals. Thus in the Crown Princess Louisa's Hospital an active and flourishing psychiatric department is working with Professor Lichtenstein, the professor of pædiatrics, as its titular head. This department not only deals with the neuroses and behaviour problems in the outpatient clinics but also enters the wards to advise on the psychological aspects of disease; for here the ætiological theories of psychosomatic disease are not only accepted but are given their chance in the treatment of such diseases as asthma and ulcerative colitis. The special departments flourish in these children's hospitals to an unusual degree. Both the Norrtull's Hospital and the Crown Princess Louisa's have cardiological departments (where angiocardiology has been developed with all the famous Swedish virtuosity in such matters), which could not be surpassed in any general or special hospital in Britain. (Yet we saw no bronchography, heard nothing of bronchoscopy, and no-one mentioned bronchiectasis or lung surgery. This may have no significance, but it could not have happened in comparable English hospitals.) And over all these departments rules the professor, a constitutional monarch, a benevolent autocrat, who arrived at his eminence after a long apprenticeship and intense competition—guiding, inspiring, encouraging, restraining—himself surrounded, stimulated, and served by many young physicians. There may be better systems, but the fruit of this tree appears to be of unexampled quality.

So twenty-five British pædiatricians look across the water, raise their glasses, say "*Skål*," drink, and look again—and for them the toast "*Skål*" implies, "Our unforgetting gratitude and to our next happy meeting."

Subcutaneous foreign bodies bizarre in nature and position were a commonplace in the days of the blitz, but happily those days are past. The other day, however, I extracted from a small inflamed sac over a man's great toe joint a feather 1½ inches long. Its host could offer no explanation for its presence and only the slight area of redness resistant to a chemist's salve had brought him to see me. I'm still wondering how it got there.

I have often been struck by the comparisons—some favourable to one, and some to the other—between my husband's waiting-room and that of his near colleague, the vet. When I remarked to the vet's wife that her life must be very like mine she smiled. "So far as the general pandemonium goes, I agree," she said, "but at least your patients don't bite." My husband thinks that the main difference between the vet's patients and his is that the vet's know when they're ill.

"What did the doctor say I had got, Nurse?" "Syphilis," was the whispered reply. "Write it down for me, dear. You feel so silly if people ask what's the matter and you can't tell them the name, don't you?"

## Letters to the Editor

### REPRESENTATION OF SPECIALISTS

SIR,—Dr. W. A. Bourne's letter of June 12 raises issues of unusual importance. He begins with some ill-founded assertions. It was the Negotiating Committee, representative of the Royal Colleges as well as the British Medical Association, which expressed the view that the State ownership of hospitals was neither necessary nor desirable. It is true that the Royal Colleges—as I understand—were far less enthusiastic in condemning State ownership of hospitals than the B.M.A. Only experience can show whether in fact the State ownership of hospitals results in higher standards of hospital service to the public.

He goes on to state that the B.M.A. lowered consultants' terms of service with local authorities. On the contrary, the general effect of the agreement reached, after long negotiation between the B.M.A. and the local authorities' associations, was to raise the rate of remuneration for consultant sessions by 60%, and to eliminate the single "reduction for quality" element. Since that agreement was reached the association has proceeded steadily and successfully to secure the raising of the rate of consultant remuneration for work undertaken for Government departments.

He asserts that the proposed representation of teachers on regional consultants' committees is too small, with the result that they may be outvoted. But the composition of regional committees is a matter for local agreement between teachers and non-teachers, and in practically all regions they have so agreed. To place the matter beyond doubt, representatives of the Provincial Teaching Hospital Staffs Association, the Association of the Honorary Staffs of the Major (Non-Undergraduate Teaching) Voluntary Hospitals, and the B.M.A. agreed at a conference last week that all regions should be advised that regional committees should provide for "20 to 25 members elected by practitioners engaged in consultant or specialist practice in the region, the relative proportions of teaching and non-teaching representatives to be determined locally in the light of conditions obtaining in the region, bearing in mind the importance of securing the adequate representation of teaching interests which should not be based on numerical considerations alone." It was further agreed (1) to recommend to the association the necessary constitutional change to secure that whoever is elected chairman of the Central Consultants and Specialists' Committee becomes, ipso facto, a member of the council, and (2) that it is desirable that of the two representatives nominated by each regional committee to the central committee, one should be a teacher and one a non-teacher.

His second criticism goes right to the heart of the matter. He argues against the democratic system under which the authority of a central committee will be derived from the rank and file of consultants, through locally elected committees which in turn elect the majority of the central committee. He condemns representative machinery—preferring, it seems, autocratic machinery provided by the colleges. One can understand his difficulty. Anyone who seeks to prove that the colleges should act for consultants in the negotiation of terms and conditions of service must meet the criticism that by their character and composition the colleges, supreme in the academic field, lack the democratic machinery which is the essential basis of a negotiating structure. Dr. Bourne meets the position not by facing the criticism but by dropping democracy. Lest anyone should quote, to the disadvantage of his argument, the successful representative machinery of the insurance practitioners, he argues that general-practitioner standards are set at the periphery and consulting standards are set at the big hospitals. Even if this were true it would relate to clinical standards. I believe that every good negotiating machine should derive its strength from the periphery through a fully representative machinery. He argues that in the B.M.A. machinery there is no special representation of physician, surgeon, obstetrician, and other specialists, forgetting that following the recommendation of Spens there should be no distinction between consultants in different branches in the field of terms and condition of service. He adds that the B.M.A. is not a body to determine grading of income. I agree wholeheartedly,

at the same time doubting whether anybody, college or otherwise, is suitable for this purpose.

To sum up, the choice must be made between autocracy and democracy. The B.M.A. is creating a central committee, elected for the most part by regionally elected committees, to deal with problems of terms and conditions of service and the protection of consultants generally. This body will be autonomous in its own field, yet able to exercise its influence in matters affecting the profession generally as a whole. To create a separate and autocratic machinery will be both damaging and dangerous.

London, W.1.

A. M. A. MOORE.

SIR,—Dr. Leys would doubtless agree that the price of professional freedom is going to be eternal political vigilance. An example will arise at the B.M.A. annual meeting. The council, contrary to the expressed opinion of those concerned, proposes to "mobilise" pathologists, sending them about to perform post-mortem examinations in special (and one hopes plain) vans. To combat this decision it has been necessary to call divisional meetings and to set in motion the complicated machinery required for the amendment of a council recommendation. It is time that the question of who evolves such a recommendation as this was investigated. Dissatisfaction with B.M.A. machinery is leading even to motions at Cambridge that the possibility of turning the B.M.A. into a trade union should be investigated; and the number supporting these motions runs, I believe, into double figures. The association is in a state of flux, and whether it can give real attention to consultants is doubtful. Consultants must realise that they are being asked to commit themselves to a B.M.A. turning from something which general practitioners know and find unsatisfactory into something whose form no-one can foresee.

As for other associations, one is in existence covering practically all the major non-undergraduate teaching hospitals. When the argument regarding State ownership of hospitals was in full swing there was wide divergence of opinion within this body. Peripheral views on general principles are obviously coloured by widely differing local conditions. Remuneration will not be settled on this kind of regional basis; and if there is divergence of views within a single region there must be still greater difficulty in integrating opinion in the whole country through isolated regional associations. Some national basis is needed, and although the Royal Colleges are not suitable for negotiation they provide a convenient and ready-made means of selecting physicians and other specialists to act as negotiators, particularly for the undergraduate teaching hospitals, with which they are in close contact. The non-undergraduate teaching hospitals likewise have their organisation over the whole country, and for negotiation they would find it satisfactory. They seem to stand closer to the undergraduate hospitals than to the B.M.A., and members of their staffs are closely connected with the colleges, through whom they have acquired their consultant status, and through whom some of them might even be prepared to negotiate.

Within a region the problem is different; it is one of maintaining standards. I do not believe any efficient hospital or department in the provinces has anything to fear from contact with undergraduate teaching hospitals; but I should certainly feel embarrassed at being on a regional committee where I was in a position to give a vote on a professional matter against the opinion of some of the leaders of the profession. There must be no suggestion that regional machinery provides a shelter for provincial inefficiency.

Hove, Sussex.

W. A. BOURNE.

#### APPEAL FOR BOOKS AND JOURNALS

SIR,—Among the 600,000 displaced persons in Germany, Austria, the Middle East, and Italy there are approximately 2500 doctors, dentists, pharmacists, and others who are actively engaged in medical practice in caring for their fellow refugees. Their work involves all aspects of preventive and curative medicine.

One of the most serious problems of this group is the difficulty of obtaining up-to-date information on the progress made in medicine, dentistry, &c., during the past ten years, and I should like to appeal through your

pages for donations of textbooks and journals to be distributed to the refugee doctors and dentists. Donations should be addressed to the Preparatory Commission for the International Refugee Organisation, 19, Hill Street, London, W.1.

Preparatory Commission for the  
International Refugee Organisation,  
Geneva.

R. L. COIGNY  
Director of Health.

#### RECORDING OF PSYCHOTHERAPEUTIC SESSIONS

SIR,—Most disquietingly, Dr. Bierer and Dr. Ström-Olsen imply in their article last week that any patient of theirs, while undergoing psycho-analysis, is liable to have his words electrically recorded without his knowledge. These words are presumably the most intimate and painful which the patient can bring himself to utter. No doubt it can be argued that what patients do not know cannot hurt them: this excuse could often be urged, but rarely accepted, for breaches of confidence in general.

Aside from ethics, is it not probable that patients will talk together, and say to newcomers: "When you go into that room with the doctor he'll have a little machine hidden there, which may be taking down all you say. You can't tell whether it's working or not?" Indeed this is suggested by the phrase, "already suspicious because of being interviewed in a room other than the ward." Will not this uncertainty inhibit the patient far more than the downright knowledge that the machine is working? What is the effect on the psychiatrist, and on the atmosphere which he creates, of being suspicious that the patient may be suspicious? No worse, perhaps, than the alternative, which is to feel sure that he is being successful in deceiving a patient who trusts him.

That no deceit is really necessary seems clear from the statement: "So far we have not met resistance in patients who knew they were being recorded." It is astonishing that the whole subterfuge should be mentioned so casually, as if it called for no defence.

London, S.W.20.

W. J. PENMAN.

#### SUPERNUMERARY NIPPLES AND NEUROSIS

SIR,—In his careful and fascinating paper of June 12, Dr. Harper would establish the significance of the supernumerary nipple as a physical stigma of neurosis. One would like to know more about the criteria of instability used in the assessment of these hundred cases, and about their origin in the general community. If, as seems likely from the paper, most came from patients in general practices and from the outpatient departments of hospitals, a highly significant selection has already taken place. It cannot be unusual to find a 40-60% incidence of neuroses in the outpatient departments of a general hospital. This series of ectopic breasts would, therefore, appear to be selected from a class that already includes a high proportion of neurotics.

The occurrence of polythelia and polymastia in the general population has variously been estimated at 1.56% (Bruce), 0.2% (Lichtenstern), and 0.25% (Guest), the last figure being based on an investigation of 20,000 English school-children. In Europeans, there seems to be a two-to-one preponderance in males, and in the East a three-to-one preponderance in females. Thus assessments differ greatly and are dependent on racial and sex variations.

In a search for stigmata and other physical correlates among 3150 psychoneurotics examined in a military psychiatric hospital during the war, I found only 5 cases of polythelia, 3 of macromastia, and 1 of congenital absence of one breast. The soldiers forming this series covered a wide field of neuroses comprising acute and chronic anxiety states, hysteria, reactive depressions, psychosomatic disorders, and psychopathy. My search was restricted to the embryological milk line, and it is possible that the significance of the more minute pigmentation points and depressions were not always appreciated. These few cases showing developmental abnormalities of breast tissue exhibited no increased degree or different type of neurosis from the majority. In a post-war search, I have met one instance of polythelia in 140 cases of antisocial behaviour disorders, homosexuality, and psychopathy. The incidence in these two series of neurotics compares favourably with the figures given for normal groups of the population, and my

impression is that this physical stigma is of little significance as a physical correlate of neurosis. To borrow from another context anent mammary tissue—one must not make mountains out of molehills.

Like the alchemist's brave and intuitive search, the seeking for physical yardsticks and stigmata of mental disease will continue. But the constitutional factors contributing to these processes are likely to be more subtle. The environment remains the overriding and determining influence in the precipitation of neurosis. The stage is set for the drama, but what happens then is all with the players.

London, W.1.

S. C. LEWSEN.

#### ADMISSION AND VISIT

SIR,—In your leading article of June 19, I see the statement: "In cases of chronic illness rigid selection is unfortunately necessary, but if the practitioner fails to secure a bed the E.B.S. will do what it can to help."

If this scheme is carried out, it would seem that large numbers of chronic sick will be unable to obtain hospital treatment. The waiting-list for hospitals which admit such patients will very soon dwarf the waiting-list of general hospitals and make it seem insignificant. Those persons who have the task of selection, be they medical or lay, will be swamped by the number of applications. It will not be easy to decide which patients should come into the few vacant beds and which must wait and wait. At present the number of discharges from chronic hospitals is extremely small: the number of deaths not very large. Already there is a traffic jam which is beginning to block beds in acute wards of general hospitals. Unless this problem is tackled at once, matters will grow worse.

This is a national problem, not a local one. The solution cannot be found in the basis of regional administration. Until the Ministry of Health makes a determined effort to create an atmosphere of treatment and progress in the chronic hospitals all over the country, the bottle-neck will grow steadily tighter. Certain hospitals, such as Orsett Lodge and the West Middlesex, can show some advances in methods of treating the chronic sick. These could be utilised in every region with benefit. Until something is done to treat the hemiplegics, the arthritics, and the incontinent with a view to getting them out of hospital back to their own homes, the problem of the chronic sick will get worse. This matter should have high priority in the National Health Service or it may conceivably wreck the whole design.

Purley.

TREVOR H. HOWELL.

#### ● ATTACK ON RHEUMATISM

SIR,—Dr. Stone wrote last week: "If orthopaedic surgeons wish to contribute to the attack on rheumatism they have it in their power to make the biggest contribution of all." What is not commonly appreciated is that except for the outstanding work of special hospitals—for example, at Bath and Buxton—the largest organised clinical attack on rheumatism in this country has been made by the well-organised orthopaedic services which are run, not by orthopaedic surgeons alone, but also by orthopaedic nurses and aftercare physiotherapists, backed by lay administrators and social workers in cooperation with the public-health authorities. The orthopaedic treatment of the postural defects of school-children and the efficient primary treatment of congenital and developmental malformations, of fractures, and of dislocations as well as of other forms of bone and joint disease, all represent an important part of this attack on rheumatism. But there is more in it than that. These orthopaedic services teach and treat, on the sound principles of physiological control and rehabilitation, large groups of established so-called rheumatic problems—e.g., chronic deforming arthritis, chronic spinal strain, sciatica, and static disorders of the feet. Operative surgery forms a small part of the work.

The attack does not need "orthopaedic physicians" who will dabble in a specialty which is already competent to take a broad view of its responsibilities. Physicians are required who will take an even broader view of the patient as a whole, and who can integrate every aspect

of the problem—social, constitutional, biochemical, endocrine, bacteriological, cardiovascular, intestinal, and so on. He must be a specialist in all fields—in other words, a real physician and nothing else.

The easiest and most efficient method of attack would be by rapid expansion of the overwhelmed orthopaedic services, to which physicians of this sort should be attached. A new sort of specialist and a new type of hospital are not needed.

Exeter.

NORMAN CAPENER.

SIR,—Dr. Stone made some apposite and incisive comments in his letter. "Rheumatism" obviously belongs to the age of humoralism, comprising as it does diseases covering the whole range of the aetiological scale denoted in that mnemonic pearl: "Trains in Granada bloody nearly meet." And yet as one of "the younger generation, beginning the study of the 'chronic rheumatic diseases'" I protest that I cannot see the problems of the quasi-specialty of rheumatology which I practise as being those of "medical orthopaedics." Why "orthopaedics"—a word not sanctified as is "rheumatics" by respectable antiquity? My brief acquaintance with this work convinces me that "orthogeriatrics" would be less inappropriate.

But let us not limit ourselves to cheese-paring modifications of infelicitous nomenclature in these days of bloodless revolution. So many of our little systems, having had their day, will cease to be on July 5. In order to conform to the finest traditions of our recently established bureaucracy, I suggest cribbing from the comprehensive denomination of the oto-rhino-laryngologist, more popularly called the B.N.T. surgeon. Why not "arthromyo-fasciologist" to be reduced in common parlance to "J.M.C. [joint, muscle, and connective-tissue] physician"?

Droitwich.

BRIAN P. WEBBER.

#### ELLIPTOCYTOSIS

SIR,—The article by Dr. El Kholi and your annotation of June 12 may stimulate some interest in this rare anomaly. I agree that it is possibly commoner than published reports indicate and that hæmatologists should be alive to its occurrence.

I disagree with the annotation, however, in the remarks about its relation to hæmolytic anaemia. It says:

"Several attempts have been made to add elliptocytosis to this hæmolytic triad and to describe an 'elliptocytic anaemia' . . . the best figures that can be quoted are those of Penfold and Lipscomb who noted 'slight jaundice' in 12% of their cases. . . . There does not seem to be any true elliptocytic anaemia; on the contrary elliptocytosis is a constant but not pathological abnormality that causes no disability."

In our paper<sup>1</sup> Lipscomb and I said: "Our own examination of the reported cases has shown that of all the known examples of elliptocytosis numbering between 350 and 400 about 50 showed some signs of abnormal hæmolysis. This gives an incidence of not less than 12 per cent." We then proceeded to give examples. Our criteria of abnormal hæmolysis in the search of the literature was one or more of the following, inexplicable by other means: a positive indirect van den Bergh reaction, increased reticulocytes, an enlarged spleen, and clinical jaundice. It was therefore not in our cases but those reported that this incidence of hæmolysis was found. This can easily be confirmed by anyone reading the literature on the subject. I suggest that the articles by van den Bergh<sup>2</sup> and Giffin and Watkins<sup>3</sup> with the section by Mason<sup>4</sup> in Downey's "Handbook of Hæmatology" would make a good beginning. In addition to our own cases which showed signs of hæmolytic anaemia, I have recently come across another family with elliptocytosis and hæmolytic anaemia. This may all be coincidence, but it is most curious; and I should advise hæmatologists on meeting the condition to test carefully for signs of hæmolysis.

Essex County Hospital, Colchester.

JOHN B. PENFOLD.

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2. Van den Bergh, A. A. H. *Dtsch. med. Wschr.* 1928, 54, 1244.
3. Giffin, H. Z., Watkins, C. H. *Trans. Ass. Amer. Phys.* 1939, 54, 355.
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## INCOMES FOR SPECIALISTS AND GOVERNMENT MEDICAL OFFICERS

SIR,—“Stepchild of the Profession” is to be congratulated on his courage in writing to you last week regarding the salaries of Government medical officers. May I add a further point which, alas, falls within my own knowledge and experience?

In 1928 the maximum salary attainable by a regional medical officer in the Ministry of Health's Insurance Medical Service was £1400, and entrants to the service were recruited from general practitioners, who were receiving a capitation fee of 9s. Today the maximum salary attainable by a regional medical officer (outside London and one or two big towns) is £1420, and yet the capitation fee for general practitioners after July 5 is to be approximately 18s.

REGIONAL MEDICAL OFFICER.

## THE COUNTRY DOCTOR

SIR,—There has recently been some discussion in the lay press about the remuneration of dentists, and now the proposed terms for specialists have been published. But we still hear nothing of the remuneration of general practitioners, who will, after all, bear the brunt of the work before the profession. If this means that the proposals issued by the Minister last December are to remain unaltered there will be a lamentable fall in the standard of living of a high proportion of general practitioners, and men in rural districts especially will be grossly underpaid as compared with their present earnings.

The scope of the country doctor is limited by the population resident in his district, and in this respect he is at a disadvantage compared with practitioners in towns, where there is frequently overlapping of practices. In country areas the number of wealthier patients paying high fees is usually rather limited, and much of the income from private practice is derived from dependants of insured persons and others of similar status. This is, of course, the type of person who will inevitably claim treatment under the National Health Service. It seems a fairly general experience that many patients who might have been expected to remain private are in fact joining the scheme, particularly the people, and dependants of such people, who are within the age-limits for compulsory insurance contributions; they feel they cannot afford to do otherwise. Thus in many districts the income from private practice will soon be negligible, and the general practitioner will be almost entirely dependent upon capitation payments.

The Minister's proposals are alleged to be based on the Spens report—but those figures were estimated for the cost of living in 1936-38, and were in fact arrived at after a study of doctors' incomes and expenditure for those years. They are thus quite inadequate for the present day.

Two points in the calculation of fees appear unjust:

(1) The fewer the patients joining the service, the higher the capitation (15s. 2d. for 95% rising to 18s. for 80% of the population). This should be reversed, if one could assume that the fewer in the service the greater the potential income from private practice. But if it be argued that this is to allow for the risk of being called on to attend as State patients those who have never registered as such, the Act is not clear on this point. Such a risk obviously involves loss to the doctor, if the National Health Insurance system is followed, whereby fees are only payable for patients on his list at the beginning of the quarter. Now that patients are free to change their doctor at any moment without notice, a man may be treated by a succession of doctors, none of whom may receive a fee unless payment is calculated from the date the patient presents his card, or (not having previously done so) from the day on which he requests treatment other than as a temporary resident on the list of a doctor elsewhere.

(2) A central fund is proposed equal to capitation of 18s. for 95% of the population. Various deductions are to be made before the actual capitation fee is calculated. This is surely unfair. Mileage and other payments should be from a separate fund, so that the real fee can be stabilised from time to time.

We have no intimation as to the amount of mileage allowance. Hitherto this has been regarded as a contribu-

tion to motoring expenses, which in the country are heavier than in towns, in proportion to the number of patients it is possible to visit. Now that capitation payment will be the main source of income, mileage allowance should be at a far higher rate than under the N.H.I. A fairer method would be to make an inducement payment to compensate for the limitation of possible work which distances and scattered populations impose, in addition to a mileage allowance as a contribution to the higher expenses of the rural practitioner for motoring, &c. A speaker at a B.M.A. meeting once said that if the capitation for town doctors were 15s. that for the country doctors should be 25s., and some such recognition, either by capitation or separate inducement, is surely justifiable.

The disastrous effect of the existing proposals on rural practice can be shown by one example, a district I know well. Assuming that the Minister's proposed 18s. for 95% of the population would cover capitation fees plus mileage and other payments, the total gross payments for the whole population for all the doctors now practising there would actually be less than the net income (after paying expenses) earned last year by exactly half those men, engaged in mixed panel and private practice. If the patients were equally divided between them, which they may not be, no man could earn as much as £1000 a year gross. Can a 50% loss be a fair remuneration for established practitioners, some of over twenty years' standing?

Does the Minister realise the real anxiety his proposals have aroused in many of us; and the genuine distress with which many are faced? Most doctors have been driven into the service solely by economic pressure; they cannot afford to stay out, but are none the less faced with serious financial loss when they are in it. Unless some improvement is offered, the Government must be prepared for a serious drop in the number of future entrants to the profession. Many doctors will now be unable to afford to put their children into medicine; others will refuse to do so owing to the conditions. Non-medical parents may well feel that this profession no longer offers a fair return for the time and expense of the necessary scientific education, so that public-school and university men will look elsewhere for a career. Medicine as a whole and the patients will thus suffer from a shortage, both in numbers and of the most suitable type of entrants. With such prospects for so many, wholehearted co-operation cannot be expected, and the service will not be a success.

Hurstpierpoint, Sussex.

RALPH GREEN.

## Public Health

### Recovery of Costs by Local Health Authorities

THE National Health Service Act enables local health authorities to recover charges for articles and services provided under sections 22, 28, and 29, subject to the Minister of Health's approval and having regard to the patient's means. The Minister of Health has now issued a circular (100/48) setting out the articles and services for which charges may be made. They are as follows:

*Under section 22* (care of mothers and young children): all articles, including meals supplied and equipment lent for use in day-nurseries, mother and baby homes, &c., except (a) welfare foods, as defined in the Welfare Foods Order, which may from time to time be supplied by the Ministry of Food for distribution by local health authorities; (b) maternity outfits for expectant mothers and dressings required during the lying-in period; (c) special cots for premature babies; (d) medicaments; and (e) dentures, eyeglasses, and similar appliances, not being replacements necessitated by lack of care on the part of the person concerned.

*Under section 28* (prevention of illness; care and after-care): all articles of extra nourishment or clothing, all garden shelters, beds, bedding, nursing requisites, and sick-room equipment (including that provided for patients being nursed at home) supplied or lent under the authorities' care and aftercare service.

*Under section 29* (domestic help): all services provided under the authorities' approved domestic-help proposals.

Standard charges for articles issued under sections 22 and 28 are not to exceed the actual cost to the authority plus 10% for handling expenses. Under section 29 the standard charge for service per hour or per day is not to exceed the actual cost to the authority, including expenses of operating the service.

It is for the local health authority to determine whether any, and if so what, charge would be reasonable, having regard to the means of the person concerned. In order to achieve reasonable uniformity, the County Councils Association and the Association of Municipal Corporations, in consultation with the London County Council, have been framing recommendations for the guidance of their constituents; and these recommendations are to include a suggested basis for assessing ability to pay.

## Parliament

### World Food Scarcity

IN the House of Lords on June 16, Viscount BRUCE OF MELBOURNE said that when the World Food Council of which he is chairman met in Washington a few weeks ago to examine the general food situation they came to the conclusion that the crop prospects for 1948 were much better than when they met last November. But adverse weather during the next few months could completely wipe out the potential gains, and, even if improvement did occur, world production would remain far below the needs for the coming year. In most of the war-devastated countries pre-war levels of food production and consumption had not been regained. If all known plans for increased food production, including the Marshall plan, succeeded (and there was considerable doubt about that), the world's food production in 1951 would only be approximately that of the immediate pre-war years. But the population of the world was increasing at the rate of 20-25 millions a year, and a large expansion of production was therefore required to keep supplies at the present level. Unless action was taken to achieve such an expansion the level of nutrition and health of the peoples of the world was likely to decline even below the standards achieved before the war. Lord Bruce urged that early and vigorous action was demanded from all governments, to whose notice the stark facts should be brought.

Lord RENNELL had seen nowhere in the pronouncements of the Government any acute sense of awareness of the food situation. As Sir John Boyd Orr and others had shown, the problem of food supply was so grave as to put any other problem into the background. At present there did not seem to be any prospect of procuring enough food adequately to feed the people in the world today. The only large area where new production of food on a large scale was possible was in Africa, and everyone was convinced of the necessity of the schemes which were now in progress there. But they were only schemes of long-term production and could not immediately be productive. The immediate prospect after this year's harvest was that there would be more and more people to eat less and less. The Marshall plan was only a palliative, but it could be a direct contribution if it was agreed that the main object was to produce more food.

Viscount ADDISON, Lord Privy Seal, agreed that probably the most urgent world problem today was the immediate shortage of food. But while it was easy to recognise the grim facts it was much more difficult to determine what we as a nation could do about it. We were bound to recognise the immense shortages which confronted us in machinery and fertilisers and in skill and the application of science. Nevertheless, the Government were fully seized of the vital importance of the topic. They had planned for increased production during the next three or four years, and they were striving still further to expand that programme. During the last two years the most complete and informed survey ever undertaken had been made of the possibilities of development of our Colonial territories, including Africa. But nobody could expect that those possibilities would be quickly realised. We must do the best we could with the shortages which now oppressed us. Lord Addison appealed to noble Lords, whatever political appellation

they applied to themselves, not to be afraid of such Socialism as was necessary to achieve some rational system of price stabilisation and control which, he affirmed, was essential if we were to carry through a plan of increased food production.

### New National Assistance Allowances

IN the House of Commons on June 16 Mr. TOM STEELE, parliamentary secretary to the Ministry of National Insurance, moved that the Draft National Assistance Regulations, 1948, be approved. These regulations, he said, would govern the general level of assistance payable to not far short of one million citizens. They would apply to people at present helped by the Assistance Board, mainly under unemployment assistance and supplementary pensions regulations, and by local authorities by way of outdoor relief and under the Poor Law blind domiciliary assistance or tuberculosis treatment allowances. For the first time a bewildering variety of relief scales and tests of need would be replaced by a uniform standard which would apply all over the country, but which, of course, would be subject to adjustment in relation to individual circumstances. The new scale was intended to provide a reasonable standard of living for those requiring long-term assistance. The single householder's rate would be 24s., and for a married couple 40s.; to both a rent-allowance could be added.

The new regulations prescribed for people who had given up work to undergo treatment for tuberculosis of the respiratory system; and also for the blind, rates of 39s. for a single person and 55s. for a married couple (both plus rent). The Assistance Board intended to administer assistance to tuberculous persons in close co-operation with the medical authorities, and the Board's local officers would keep in touch with the tuberculosis officers at the local dispensaries.

The new regulations, if approved, would come into effect on July 5. The additional cost to the community of substituting the new standards now proposed would be £9 million a year, without allowing for a probable increase in the numbers applying for assistance. The whole cost in future would come from the Exchequer. The motion to approve the regulations was agreed to.

## QUESTION TIME

### Payment of Tuberculosis Allowances

Dr. SANTO JEGER asked the Minister of National Insurance whether he was aware that it was proposed after July 5 to require tuberculosis patients to draw their allowances from post offices; and whether, in view of the recognised necessity for maintaining close contact between these people and their local tuberculosis care committees and the undesirability of asking tuberculosis patients to stand in queues with the general public, he would make it possible for them to receive their payments through the care committees.—Mr. JAMES GRIFFITHS replied: Assistance under the National Assistance Act to persons undergoing treatment for tuberculosis will in the great majority of cases be paid in supplementation of sickness benefit under the National Insurance Act which is normally payable by orders cashable at a post office. It is not essential for the patient to attend personally at the post office. If he signs the order he can authorise someone else to cash it on his behalf.

### Pensions Entitlement in Cancer Cases

Mr. D. L. LIPSON asked the Minister of Pensions how many applications for a pension had been refused in respect of ex-Servicemen suffering from cancer; and would he arrange for all these to be automatically reviewed in the light of the recent judicial decision.—Mr. GEORGE BUCHANAN replied: The number of applications in respect of cancer which have been rejected is estimated to be about 5500. Pensions have been granted in respect of cancer in about 1000 cases. Mr. LIPSON: Is the Minister referring to the cases that were granted before the recent judicial decision?—Mr. BUCHANAN: Although the learned judge arrived at that decision, we were operating that plan before he came to that decision. In the judge's case there was a conflict of facts, but we have been operating it for some time. Wherever a person suffering from cancer could link that disability up with another disease and it could be proved that that was as a result of war service,

my instructions were to exercise the new proposals to the greatest possible extent.

Sir T. MOORE: Will the Minister bear in mind that at one critical moment this disease ceases to be innocent and becomes malignant, and that that is the time the Ministry's medical officials do not seem able to define? Will he also take the opportunity of having these cases reviewed?—Mr. BUCHANAN: We may not be doing as much as some members would like, but compared with anything done in the past we are miles ahead. In the past it used not to be possible to allow cancer applications in any way, and now we are doing it to the extent I have outlined. If my hon. friends want me to grant pensions without a doctor's certificate, I will soon do it, but none must grumble at the money that has to be found if that is done. As long as I am bound by medical evidence and learned judges' decisions in court, then I must rule out cancer in most cases, but whenever we can link it up to any other circumstance it can be taken that both my officials and myself try to do it in the most kindly and humane way possible.

#### New Beds in Scottish Hospitals

Replying to questions Mr. ARTHUR WOODBURN stated that the number of new maternity beds provided in hospitals in Scotland during 1945, 1946, and 1947 was 46, 168, and 86 respectively. No new buildings for tuberculous patients had been provided in the years referred to, but 300 more beds were brought into use in existing hospitals in 1947.

#### Remuneration of Specialists in the R.A.M.C.

Mrs. JEAN MANN asked the Secretary of State for War how far remuneration to physicians and surgeons with full specialist qualifications and experience serving in R.A.M.C. compared with the recommendations of the Spens Committee.—Mr. MICHAEL STEWART replied: No exact comparison can be made between specialists in the R.A.M.C., and the civilian specialists with whose remuneration the report mentioned in the question is concerned.

#### Register of Disabled

In answer to a question Mr. NESS EDWARDS stated that the number of registered disabled persons in Great Britain on May 17, 1948, was 885,000 of whom 76,471 were recorded as unemployed, including 10,587 classified as severely disabled and needing sheltered employment.

#### Defaulting Contributors

Major TUFTON BEAMISH asked the Minister of Health how far persons who defaulted with their subscriptions to the National Insurance General Scheme or to the Industrial Injuries Insurance would still receive the full scale of medical services provided under the Health Act after July 5.—Mr. A. BEVAN replied: Entitlement to the health service does not depend on contributions at all.

#### Dentists and the National Health Service

Sir ERNEST GRAHAM-LITTLE asked the Minister why he had decided not to incorporate in his amending Bill a provision to prevent a whole-time salaried service for the dentists being introduced by regulation; and whether, in view of the undertaking he had given to the medical Negotiating Committee to make this concession to the doctors, he would reconsider this decision.—Mr. BEVAN replied: While there is no intention of introducing a whole-time salaried service for dentists working in private surgeries, salaries or sessional fees are in my view the most appropriate form of remuneration for dentists in health centres and I could not therefore accept the proposal.

#### Conditions in Mental Hospitals

Major SIMON RAMSAY asked the Minister of Health whether he would set up a commission to inquire into conditions existing within the mental hospitals of England, Scotland, and Wales.—Mr. BEVAN replied: No. I am not aware it is needed, and it would be untimely just when I am about to try a new administrative organisation.

Prof. J. C. SPENCE will leave England on June 30 to visit Australia at the invitation of the Federation of Australian Postgraduate Committees to lecture in Sydney, Brisbane, Adelaide, Melbourne, and Hobart. He will attend the Australasian Medical Congress in Perth in August, and in September he will visit New Zealand to take part in a symposium on child health and children's diseases arranged by the dean of the medical school at Dunedin.

## Obituary

### ALFRED MILNE GOSSAGE

C.B.E., M.A., D.M.OXFD

Dr. A. M. Gossage, who died in London on June 8, was consulting physician to the Westminster Hospital and to the East London Hospital for Children, now part of the Queen Elizabeth Hospital for Children.

He was born in 1864 in Lancashire, and educated at Clifton College and Magdalen College, Oxford, where he obtained his B.A. with first-class honours in natural science in 1886. Four years later he took the Conjoint qualification from the Westminster Hospital, and the following year he took the degrees of M.A. and B.M. After holding a house-appointment at the Brompton Hospital he became medical registrar at the Westminster Hospital where he later joined the honorary staff. In 1903 he was elected F.R.C.P. and in 1907 he proceeded to his D.M. degree.

During the 1914-18 war he served with the R.A.M.C. with the rank of major, and later he acted as director of medical services for the Ministry of Pensions. He was appointed C.B.E. in 1920.

For many years a lecturer in medicine at Westminster Hospital he also examined for the Conjoint Board and for the universities of Oxford and London. He was a frequent speaker at medical meetings in London during the first decade of the century, being especially interested in the familial incidence of disease, and in 1908 he wrote in the *Quarterly Journal of Medicine* on the inheritance of abnormalities. He contributed the chapters on syphilis and on heredity to Garrod and Batten's *Diseases of Children* and on Raynaud's disease and infantile convulsions to Latham and English's *System of Treatment*.

Dr. Gossage married Miss B. P. Stevenson, of Montreal, and they had a son and a daughter.

Sir D'ARCY THOMPSON, C.B., F.R.S., died at the age of 88 on June 22 at St. Andrews, where he had held the chair of natural history for over 60 years. His classic study, *Growth and Form*, appeared in 1917.

## Diary of the Week

JUNE 27 TO JULY 3

### Monday, 28th

INSTITUTE OF LARYNGOLOGY AND OTOTOLOGY, 330, Gray's Inn Road, W.C.1

5.30 P.M. Dr. Arthur Proetz (St. Louis): Surgical Treatment in Relation to the Physiology of the Nose.

### Tuesday, 29th

ROYAL COLLEGE OF SURGEONS, Lincoln's Inn Fields, W.C.2

5 P.M. Prof. H. J. Seddon: Bone Growth.

6.15 P.M. Dr. Stanley Rowbotham: Relation of Endocrine Imbalance to Anesthesia.

KETTLE MEMORIAL LECTURE

5 P.M. (St. Mary's Hospital, W.2.) Prof. W. D. Newcomb: Bone Growth and Absorption.

INSTITUTE OF DERMATOLOGY, 5, Lisle Street, W.C.2

5 P.M. Dr. H. Gordon: Pityriasis in Skin Therapy.

EDINBURGH POST-GRADUATE BOARD FOR MEDICINE

5 P.M. (Edinburgh Royal Infirmary.) Prof. D. M. Dunlop: Changing Concepts in Therapeutics.

### Wednesday, 30th

ROYAL COLLEGE OF SURGEONS

5 P.M. Mr. H. Osmond-Clarke: Strains and Sprains.

6.15 P.M. Dr. A. H. Galley: Continuous Caudal Analgesia in Obstetrics.

### Thursday, 1st

ROYAL COLLEGE OF SURGEONS

5 P.M. Mr. John Loewenthal: Treatment of Intractable Ulceration of the Leg with special reference to Streptomycin. (Hunterian lecture.)

5 P.M. Mr. J. G. Bonnin: Fractures of the Pelvis.

6.15 P.M. Dr. R. P. Harbord: Anesthesia in relation to Shock.

### Friday, 2nd

ROYAL COLLEGE OF SURGEONS

5 P.M. Mr. Bryan McFarland: Birth Fractures.

6.15 P.M. Dr. G. Edwards: Basal Narcosis.

UNIVERSITY OF EDINBURGH

5 P.M. (University New Buildings, Teviot Place.) Prof. E. B. Astwood (Boston): Use of Radioactive Iodine in the Study of Thyroid Function in Man. (Cameron lecture.)

## Notes and News

### HELPING THE RHEUMATIC PATIENT

THE British Rheumatic Association, formed last year by victims of rheumatism, has as its aims the improvement of resources for diagnosing and treating the rheumatic group of diseases, and the assistance of individual sufferers. At the inaugural general meeting, held at the Mansion House on June 17, Dr. F. Hernaman-Johnson, chairman of the association's council, pointed to the need for early treatment of rheumatoid disorders in the young, and particularly of rheumatoid arthritis. Often, however, the most skilled treatment was useless without proper rest; and the association hoped to raise funds to build rest homes for such patients. Colonel M. Stoddart-Scott, M.D., M.P., vice-chairman of the council, explained that the association is an organisation for patients and their friends so that a "trade union" may be brought into being to look after the interests of all types of sufferers. Lord Horder, the hon. vice-president, explained that whereas the Empire Rheumatism Council is concerned with research, the association will deal with social aspects and will seek to educate the public.

### SUPPLEMENTARY OPHTHALMIC SERVICE

A SEPARATE central list of doctors having the prescribed qualifications for participation in the supplementary ophthalmic service<sup>1</sup> will be compiled for Scotland. Application forms received at B.M.A. House, London, from practitioners in Scotland will therefore be automatically forwarded to the Scottish Secretary, B.M.A. House, Drumshugh Gardens, Edinburgh, for submission to the Scottish qualifications committee.

### ARTIST IN HOSPITAL

GIVEN pencil, crayons, or water-colours Anna Zinkeisen can be relied on to do justice to medical subjects; but when she turns to oils she becomes a little smooth and specious. In her exhibition of "Technical and Other Medical Paintings" now on view at the Royal Society of Medicine, doctors and surgeons are too noble, nurses too often equipped with monstrous lucent eyes, injured people too theatrically beautiful, skins too smooth, starch too crisp, and attitudes too graceful for this workaday world. But these romantic interpretations are offset by many samples of exact observation and just and delicate recording: limb wounds, a perforated thorax, multiple superficial wounds of the back, tumours of breast and brain, examples of pharyngostomy and pharyngolaryngostomy, the bone ends in caisson disease, and a sacrococcygeal tumour are all faithfully and exquisitely shown. In a few cases the artist's observation has not tallied closely enough with the doctor's to be useful, though the colours and form are pleasing. Sometimes the legends are inaccurate or puzzling—in the case of one skull wound, for example, it is not possible to decide what exactly befell the patient. Crayon sketches of theatre scenes, though not as solid and satisfying as Barbara Hepworth's, are bluntly honest, and beautifully drawn. One is left with a feeling of gratitude to Miss Zinkeisen who, despite her taste for ordered elegance, has been ready to study and record gross destruction of bone and limb, and to move among the disasters found in hospitals in war-time.

### University of Oxford

Dr. J. P. Herdman has been elected to the Schorstein research fellowship for 1948-49.

### University of Cambridge

On June 22 the senate was asked to sanction the conferment of the honorary degree of LL.D. on Prof. T. B. Davie, F.R.C.P., principal and vice-chancellor of the University of Cape Town.

On June 12 the following degrees were conferred:

M.D.—F. M. P. Eckstein, P. W. Hutton,\* E. Watson Williams,\* Hugh Stott.

M.B., B.Chir.—J. P. M. Bensted, M. C. H. Bennett.

\* By proxy.

### University of Sheffield

The following appointments are announced: Dr. P. W. W. Gifford, medical officer for the student health service; Dr. B. E. Heard, assistant lecturer in pathology; Dr S. J. Barr, tutor in obstetrics; and Dr. Tom Smith, assistant tutor in obstetrics.

### University of Leeds

Prof. D. R. MacCalman has been appointed to the Nuffield chair of psychiatry from Oct. 1.

Dr. MacCalman, who is 44 years of age, was educated at Glasgow Academy and the University of Glasgow. For a time he worked in America at the Boston Psychopathic Hospital and the Johns Hopkins Hospital, and he also held posts in Glasgow and London before taking up the Crombie-Ross lectureship in psychopathology in the University of Aberdeen in 1938. When the Crombie-Ross chair in mental health was created two years ago he was appointed to it.

### Royal College of Surgeons of England

During July the following lectures will be given at the college, Lincoln's Inn Fields, London, W.C.2: Mr. John Loewenthal, Treatment of Intractable Ulceration of the Leg with Special Reference to Streptomycin, Thursday, 1st; Dr. Richard B. Cattell (Lahey Clinic), Carcinoma of the Pancreas, Thursday, 8th; Prof. Andrew Jackson, D.D.S. (Temple University, Philadelphia), Growth and Development from the Clinical Aspect of Orthodontics, Friday, 16th; Prof. John Beattie, Changes in Volume and Distribution of Body Water Under Conditions of Stress, Thursday, 22nd; Dr. Malcolm Carr, D.D.S. (New York), Acute Infections of the Face and Neck of Dental Origin, Wednesday, 28th; Prof. Shafik Shalaby (Cairo), Amoebic Liver Abscess, Thursday, 29th. All the lectures will take place at 5 P.M.

A course of lectures on anatomy, applied physiology, and pathology in their application to dental surgery will be held during July, and another on general, oral, and dental surgery during September.

### R.A.F.'s New Matron-in-Chief

Principal Matron Miss Helen Wilson Cargill has been appointed matron-in-chief, Princess Mary's Royal Air Force Nursing Service, in succession to Miss Gladys Taylor, who is to retire on July 16 having completed her term of appointment.

### West London Medico-Chirurgical Society

The society held a reception at 1, Wimpole Street, W.1, on June 15, on the occasion of the Cavendish lecture. About 200 people were present and the guests were received by Dr. E. N. Snowden, the president. Afterwards Prof. E. N. da C. Andrade, D.Sc., F.R.S., the Cavendish lecturer, spoke on the Atom and its Energy. The meeting was followed by the annual conversazioni of the society.

### Committee on Industrial Productivity

The members of this committee's human factors panel include Brigadier Alfred Torrie, M.B. (War Office), Mr. S. Wyatt, D.Sc. (Medical Research Council), and Dr. A. T. M. Wilson (Tavistock Institute of Human Relations). The panel's terms of reference are to advise the committee "regarding the directions in which productivity could be increased by the application of research into the human factors in industry; and to make recommendations for further researches in this field where called for."

### International Students Clinical Congress

The British Medical Students Association is holding an international congress of clinical medicine from July 6 to 23 in London, Birmingham, and Oxford under the presidency of Prof. J. A. Ryle. Delegates from more than 30 countries are to attend. The work of the congress will consist of ward teaching, lectures, medical films, demonstrations, and visits to research and industrial laboratories. The public relations officer to the congress may be addressed at the association's office, B.M.A. House, Tavistock Square, London, W.C.1.

### Scientific Information Conference

At the opening of this conference, arranged by the Royal Society, Sir Robert Robinson, F.R.S., said that its purpose was to recommend improvements on existing systems of publishing, abstracting, and indexing original scientific work. He emphasised the importance of speedy communication of new scientific knowledge within the Empire. The conference, which will continue for a fortnight, is the result of a request made at the 1946 Royal Society Empire Scientific Conference and by the British Commonwealth Scientific Official Conference in the same year. The meetings are being attended by Dominion and Colonial representatives, and by delegates from the National Academy of Sciences in the U.S.A. and from UNESCO headquarters in Paris.

1. See *Lancet*, June 19, p. 970.

**International Socialist Medical Conference**

This conference, organised by the Socialist Medical Association, has been held in Surrey during the past week.

**Association of Clinical Pathologists**

This association is to hold a meeting at Sheffield University on Friday and Saturday, July 16 and 17.

**Association of Medical Records Officers**

This association has arranged a course for records officers in the north-east metropolitan region, at St. Bartholomew's Hospital on June 26-27; and for those in the Manchester region, at the Royal Infirmary on July 17-18. Other courses are planned for Cardiff, Liverpool, Leeds, London, Newcastle, and Sheffield. A course was held at Bristol on May 29-30.

**Society for Relief of Widows and Orphans of Medical Men**

The annual general meeting of the society was held on June 2, with Sir Robert Young, the president, in the chair. Income for 1947 exceeded expenditure by £688, and the membership at the end of the year was 261. Of the seven widows who had died, one had received £3793 in grants to herself and her children. The total sum distributed in grants was £4500. Widows over 65 years of age received £75, and those under 65 received £60, and at Christmas presents of £20 were made to each. The address of the society is 11, Chandos Street, London, W.1.

**New Research Institutes in the U.S.A.**

The establishment of a national heart institute has been approved by both the Senate and the House of Representatives. The Bill under which the institute would be set up places it within the U.S. Public Health Service, and authorises a Federal programme for research similar to those already in existence for cancer, mental health, tuberculosis, and venereal diseases. The Bill also calls for the creation of a national advisory heart council to coördinate research by government and private agencies. Similar legislation for a national institute of dental research within the Public Health Service has already been approved by Congress.

**B.C.S.O. (London)**

The British Commonwealth of Nations Scientific Liaison Offices (London) have been opened on the third floor of Africa House, Kingsway, W.C.2. For a number of years several of the Commonwealth countries have maintained scientific liaison offices in London and these together with the ones about to be established will now all have their headquarters in Africa House. Each of these offices will retain complete independence, but for ease of reference the group will be known as B.C.S.O. (London). The scientific liaison offices of Australia, Canada, Central African Council, India, New Zealand, South Africa, and the United Kingdom are taking part in the scheme.

**Harveian Society of London**

At the Buckston Browne annual dinner of this society, held at the Royal College of Surgeons on June 17, the memory of William Harvey and of Sir Buckston Browne was honoured in silence. Sir William Gilliat, F.R.C.O.G., proposing the toast of The Society, reported that it is flourishing, with some 300 members. Mr. E. G. Muir, the president, said that Harvey's name stood for courage and clear thinking—two qualities now much needed by the profession. Was this a time of twilight or of dawn? The National Health Service held powers of great good but also a threat to professional freedom, and it was more than ever necessary for doctors to draw together in their societies. Lord Balfour of Burleigh, responding to the toast of The Guests, proposed by Mr. Rodney Smith, said he felt that the complete liberty of publication assured to members of the service was a great safeguard to professional freedom. Referring to Sir Alfred Webb-Johnson's elevation to the peerage, he remarked that half the work of the House of Lords is done by peers of first creation. Sir Frederick Sellers also expressed the thanks of the guests to the society for what he rightly called "a bit of a do."

Dr. Edmond Kerpel-Fronius, director of the children's clinic and professor of paediatrics in the University of Budapest at Pecs, is visiting Britain under the auspices of the British Council.

**Appointments**

ADAMS, J. C., M.D. Lond., F.R.C.S.: asst. orthopaedic surgeon, St. Mary's Hospital, London.  
 ALWYN-SMITH, PETER, M.B. Lond.: M.O. for Metropolitan Regional Hospital Boards, Emergency Bed Service (King Edward's Hospital Fund), London.  
 DAVIDSON, WILLIAM, M.B., D.M.R.D.: asst. radiologist, Royal Halifax Infirmary.  
 KELHAM, GEOFFREY, M.B. Camb., D.M.R.E.: radiologist, Royal Surrey County Hospital, Guildford.  
 KILPATRICK, F. R., M.S. Lond., F.R.C.S.: surgeon, St. Peter's Hospital for Stone, London.  
 KITSON, J. H., M.B. Manc., D.P.H.: divisional M.O., divisional school M.O., and M.O.H., Bredbury and Romiley, Hazel Grove and Bramhall, Marple and Disley.  
 PATERSON, J. E. A., M.B. Glasg., D.M.R.D.: asst. radiologist, Royal Hospital for Sick Children, Glasgow.  
 SMART, JOSEPH, M.D. Camb., M.R.C.P.: physician, Connaught Hospital, London.  
 STEEDS, J. H., M.B. Camb., D.C.H.: assistant to children's dept., Middlesex Hospital, London.  
 STRADLING, PETER, M.D. Lond., M.R.C.P.: chest physician in charge of tuberculosis dispensary, Postgraduate Medical School of London.

**Guy's Hospital, London**

GLOVER, F. N., M.S. Lond., F.R.C.S.: asst. surgeon.  
 HELLWELL, P. J., M.B. Edin., D.A.: anaesthetist.  
 LAWRIE, R. S., M.D. Lond., M.R.C.P., F.R.O.S.: asst. surgeon.  
 MACKETH, R. C., D.M. Oxfrd, M.R.C.P., D.C.H.: asst. physician, paediatric dept.  
 WAYTE, A. B., M.R.O.S., D.M.R.E.: asst. surgeon, radiotherapy dept.

**Births, Marriages, and Deaths****BIRTHS**

AMBACHE.—On June 18, at St. Mary Cray, the wife of Dr. N. Ambache—a daughter.  
 BARBER.—On June 15, at Chiddingfold, the wife of Dr. Denis Barber—a son.  
 CHASE.—On June 16, at Bridport, Dorset, the wife of Dr. Anthony Chase—a son.  
 COOMBS.—On June 14, at Bristol, the wife of Dr. C. J. F. Coombs—a son.  
 KELLERMAN.—On June 12, at Colchester, the wife of Dr. Francis Kellerman—a son.  
 KELSEY.—On June 14, at Hamburg, the wife of Captain Denys Kelsey, R.A.M.C.—a daughter.  
 LANGSTON.—On June 10, the wife of Mr. H. Heber Langston, F.R.C.S., Winchester—a daughter.  
 MCCRACKEN.—On June 11, the wife of Dr. G. H. McCracken, Glasgow—a son.  
 MACLENNAN.—On June 19, in Glasgow, the wife of Dr. H. R. MacLennan—a son.  
 MACONIE.—On June 16, at Windsor, the wife of Mr. A. C. Maconie, F.R.C.S.—a son.  
 MARTIN.—On June 16, in London, the wife of Dr. T. D. M. Martin—a daughter.  
 MAYER.—On June 18, the wife of Mr. J. H. Mayer, F.R.C.S., Tunbridge Wells—a son.  
 MILLS.—On June 13, at Cambridge, the wife of Dr. J. N. Mills—a daughter.  
 OGLIVIE.—On June 17, at Colchester, the wife of Mr. T. Alexander Ogilvie, F.R.C.S.—a daughter.  
 RUDD.—On June 13, at Aylesbury, the wife of Dr. Peter Rudd—a daughter.  
 SCADDING.—On June 17, in London, the wife of Dr. J. G. Scadding—a son.  
 STAFFORD-CLARK.—On June 12, at Bromley, the wife of Dr. David Stafford-Clark—a son.  
 WILLOUGHBY WOOD.—On June 13, at Leicester, the wife of Dr. James Willoughby Wood—a daughter.  
 WRIGHT.—On June 16, in London, the wife of Dr. J. T. Wright—a son.

**MARRIAGES**

CONWAY—DONALD.—On June 10, at Paisley, Hugh Conway, M.R.C.P., to Lillian Isabel Donald, M.B.  
 DAVENPORT—MAY.—On June 17, in London, James Edward Davenport, M.R.C.S., surgeon commander, R.N., to Helen Dora Stewart May.  
 FOORD—HIBBERT.—On June 16, Hugh Foord, M.R.C.S., to Katherine Hibbert.  
 HOUSTON—MACKIE.—On May 25, at Moascar, Egypt, Ronald Houston, M.B., captain, R.A.M.C., to Eileen Mary Mackie.  
 WILES—CHETWYND-STAPYLTON.—On June 12, at Whiteley Village, Dennis Worsley Wilks, M.R.C.S., to Bridget Chetwynd-Stapylton.

**DEATHS**

BARNES.—On June 17, at St. Albans, Augusta Schram Barnes (née Inglis), M.B. Edin., aged 36.

Messrs. Parke, Davis & Co. inform us that they have transferred their London offices from Beak Street to Staines Road, Hounslow. Goods urgently required in the London area can be obtained from Messrs. Brooks and Warburton, 232-242, Vauxhall Bridge Road, S.W.1, or, outside normal business hours, from Messrs. John Bell & Croyden, 50, Wigmore Street, W.1.



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*Institutions and Corporations with the right to the prefix Royal will be found under that prefix, with the exception of Medical Societies, which are separately indexed under Societies. All Universities are indexed under the word Universities. (A) = Annotation, (C) = Correspondence, (LA) = Leading Article, (ML) = Medicine and the Law, (NI) = New Invention, (O) = Obituary, (P) = Parliament, and (R) = Review.*

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