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CHEMIESE ANTISEPSE

Die geskiedenis van die wetenskaplike pogings wat gedurende die afgelope eeu aangewend is om bakteriese infeksies met chemiese middels te bestry is terselfdertyd 'n oorsig wat die hele gebied van bakteriologie dek. Chemoterapie het ná die vroeër stadiums van antiseptiese en ontsmetting ingetree en mediese navorsers het oënskynlik nou eers dié stadium bereik waar die waarde van baie van die alledaagse en erkende preparate suiwer bakteriologies vasgestel kan word.

Dit is van meer as akademiese belang want 'n onlangse verslag uit die Verenigde State maak melding van die eerste streptokokke¹ wat teen eritromisien weerstand bied. Op die oomblik is eritromisien die laaste oorblywende antibiotiese wapen teen die streptokokke. Misluk die antibiotika dan sal geneeskundiges weer die soektog na 'n doeltreffende kiemdodende middel moet hervat—'n soektog wat die tydperk vóór penisillien gekenmerk het.

Sedert die dae dat Semelweiss sy hande met chloor-kalk ontsmet het—en daarvoor uitgejou was—en Lister in 'n ope breuk suiwer karbolsuur gebruik het, soek die wêreld nog steeds na 'n chemikalie wat nie net die vel ontsmet nie maar ook die vermenigvuldiging van bakterieë in 'n chirurgiese of traumatiese wond sal verhoed. Lister het dit gelukkig getref dat die gevolge van karbolsuurvergiftiging of van ernstige weefselnekrose nie vir sy pasiënt noodlottig was nie; karbolsuur is egter nog vandag die maatstaf vir alle ander preparate.

Sir Almroth Wright was die eerste om te ontwaak uit die droom dat chemiese middels 'n wond doeltreffend kon ontsmet. Die akri- en proflavienes het destyds hoogty gevier en hy het met minagting die gedagte bejeën dat chemiese middels goed is vir 'n wond wat té diep of nie betyds behandel is nie. Ongeveer op hierdie tydstip is dit ook beseft dat 'n antiseptiese oplossing isotonies en tot 'n gepaste *pH* gebuffer moet word om van waarde te wees. Hierna geoordeel het baie van die standaardpreparate nie die paal gehaal nie. Alhoewel mercurochrome bv. besonder byval in die 1920s gevind het en 'n reputasie besit het wat vandag nog deur talle geneeshere aanvaar word, verklaar so 'n gesaghebbende soos professor L. P. Garrod^{2, 3} dat: „Faulty laboratory work and credulous clinical observations have rarely perpetrated a thera-

EDITORIAL

CHEMICAL ANTISEPSIS

To recount the scientific attempts that have been made to combat bacterial infection by chemical means over the last century is to survey the entire field of bacteriology. The earlier stages of disinfection and antiseptics have been followed by that of chemotherapy, and medical research workers have probably only now reached the stage where a true bacteriological assessment can be made of the value of many of the preparations accepted and in daily use at the present time.

This is of more than academic interest, for a recent publication in the United States reports the first erythromycin-resistant strain of streptococci,¹ against which erythromycin is at present the last antibiotic line of defence. If the antibiotics were to fail, the medical profession would revert to the search for an effective antiseptic agent that characterized the pre-penicillin era of medicine.

Ever since Semelweiss disinfected his hands with chlorinated lime (and was laughed out of school for it) and Lister introduced pure carbolic acid into a compound fracture wound, the world has been searching for a chemical that will not only render the skin antiseptic but also prevent bacterial multiplication within a surgical or a traumatic wound. Lister was lucky that his patient survived death from carbolic acid poisoning or the delayed effects of extensive tissue necrosis; nevertheless, carbolic acid has remained to the present day the measure beside which all other preparations are made to stand or fall.

Sir Almroth Wright poured the first effective douche of cold water on the idea that a wound could be satisfactorily disinfected by chemical means. It was the heyday of the flavines, acri- and pro-, and he scorned the notion that a wound whose depths were inaccessible or in which treatment was delayed could be benefited by their application. About this time, too, it came to be appreciated that for an antiseptic solution to be useful it must be isotonic and buffered to a suitable pH. By these criteria many of the standard preparations failed to pass muster. Although mercurochrome, for

peutic fraud on such a scale . . . I find mercurochrome quite incapable of doing what was claimed for it'.

Die flaviene het oënskylik aan die voorpunt van plaaslike antiseptiese gestaan maar in die jongste tyd word daar aanspraak gemaak vir 'n nuwe preparaat Hibitane (bis-p-chlorophenyl-diguanido-hexane) wat moontlik die flavine uit hul plek sal lig. Onder dieselfde eksperimentele kondisies is gevind dat as muise—wat eers met 'n virulente kweek van *Streptococcus pyogenes* ingespuut is—'n parenterale inspuiting van Hibitane kry, die oorlewingsyfer 90% was, in vergelyking met 'n 30%-syfer vir die flaviene. Met die oog op die verhoogde weerstand wat hierdie organismes tot die antibiotika bied, is Hibitane 'n naam wat die moeite werd mag wees om te onthou.

Die ideaal van die kliniese bakterioloog—'n doeltreffende antibakteriese middel vir die liggaam—is eers in 1935 deur die sulfonamide bereik. Daarna, in 1940, het die eerste van die antibiotika—penisillien—'n hele onwenteling in die mediese wêreld teweeggebring met die gevolg dat navorsing i.v.m. plaaslike antiseptiese middels nie meer so dringend was nie en selfs 'n bietjie verouderd; deesdae word die bakterioloog se tyd grotendeels in beslag geneem met die bepaling van die doeltreffendheid van die antibiotika in die stryd teen verskillende organismes. Ondersoek na die gebruik van die meer alledaagse chemikalieë wat gebruik word om bakterieë te bestry is minder interessant en op hierdie tydstip minder dringend; dit ly egter geen twyfel nie dat hul in die daelike lewe van waarde bly. In sommige inrigtings alvorens hul ontslaan word, word pasiente wat van aansteeklike siektes herstel nog in 'n karboloplossing 'gebade', wat 1/6de van die vermoedelik kiemdodende sterkte is; en wie kan beweer dat sterilisasie en antiseptiese soos dit vandag in die huis, die spreekkamer en die hospitaal toegepas word, nie verbeter kan word nie?

1. Martin, W. J., Nichols, D. R., Wellman, R.E. en Geraie, J. E. (1954): Proc. Mayo Clin., 29, 379.
2. Garrod, L. P. (1955): Proc. Roy. Soc. Med., 48, 26.
3. *Idem* (1931): *Ibid.*, 24, 82.

example, had a tremendous vogue in the 1920s and gained a reputation which is accepted by countless practitioners to the present day, no less an authority than Professor L. P. Garrod^{2, 3} states: 'Faulty laboratory work and credulous clinical observations have rarely perpetrated a therapeutic fraud on such a scale . . . I find mercurochrome quite incapable of doing what was claimed for it'.

The flavines seemed to lead in the field of local antiseptics, but recent claims for a new preparation, Hibitane (bis-p-chlorophenyl-diguanido-hexane) might well herald their fall from favour. Under equal experimental conditions parenteral injection of Hibitane following injection of a virulent culture of *Streptococcus pyogenes* was found to produce a 90% survival rate in mice as compared with 30% with the flavines. In view of the increasing resistance of these organisms to antibiotics, Hibitane may well be a name to remember.

The ideal of the clinical bacteriologist—an effective systemic antibacterial agent—was only realized with the advent of the sulphonamides in 1935. Thereafter, in 1940, the first of the antibiotics—penicillin—revolutionized medicine and rendered work on local antiseptic agents less urgent and slightly out-of-date; today much of the bacteriologist's time is taken up with an assessment of the efficacy of the antibiotics in combating different strains of organisms. Investigation of the uses of more ordinary chemicals in dealing with bacteria is less interesting, and at present less urgent; but of its value in everyday life there can be no doubt. In some institutions convalescent patients with infectious diseases are still subjected to a 'carbolic bath' in a solution about 1/6th of the strength likely to be bactericidal, in order to render them fit for discharge; and who is to say that present-day standards of sterilization and asepsis as practised in the home, the surgery and the hospital, cannot be improved?

1. Martin, W. J., Nichols, D. R., Wellman, R. E. and Geraie, J. E. (1954) Proc. Mayo Clin., 29, 379.
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PHYSIQUE, TEMPERAMENT AND DISEASE

The relationship between body build and disease is an idea as old as medicine itself. Hippocrates separated *Homo phthisicus* from *Homo apoplecticus*. The clinicians of the 19th century observed that the colic of gallstones occurred in the fat, flatulent female of forty and, more recently, insurance companies have gone to great lengths to convince us that obesity leads—via arterial disease and diabetes—towards an early grave.¹

The difficulty has always been to find objective standards by which to record human physique. It is generally known, for instance, that two persons falling in the same height-weight ratio—possibly both 'normal' according to the insurance tables—may be as different physically as chalk and cheese. Varying grades of muscle and fat content and linearity of body may put two entirely different types of person into the same group according to height and weight. Many workers have tried to overcome this difficulty. Kretschmer, in

the 1920s, added a third type to Hippocrates' two, dividing man into pyknic, asthenic and athletic types, and Sheldon *et al.* carried this a step further by attempting to make the assessment more objective. By employing a regular technique—taking 3 photographs of each subject in the nude, standing on a turn-table in front of a grille—they were able to render subjective estimations statistical. Three types, or somatotypes, now emerged, viz.:

Endomorph: roundness of physique, with tendency to put on fat, antero-posterior diameter equal to lateral diameter, and the abdomen preponderating over the chest; small hands and feet; hypoplastic genitalia.

Mesomorph: heavily-muscled, Herculean physique; square, broad shoulders, with narrow waist and massive, heavily-muscled limbs; the chest preponderating over the abdomen.

Ectomorph: linearity of physique most marked—tall,

'gangling' type, with relatively short trunk, long legs and neck, and prominent Adam's apple; drooping shoulders, and acute costal angle.

Sheldon next attempted to correlate these 3 different physiques with 3 variations in temperament—viscerotonia, somatotonia and cerebrotonia—and found that there was sufficient correlation between the respective physique-types and the corresponding temperament-types to be significant. Thus the endomorph showed viscerotonic tendencies (e.g. complacency, love of comfort and food, sociability), the mesomorph was somatonic (e.g. assertive, insensible to discomfort, taking joy in physical exertion), and the ectomorph was cerebrotonic (restrained, lonely, mentally sharp and alert, introverted).

So far, so good. Even if temperament can be related to body build—and Sheldon believes it can—is the ensuing somatotype proved in a particular disease-pattern? Kretschmer had found that most of his pyknics were cyclothymics with a tendency to manic-depressive psychoses, and that his asthenics were potential schizophrenics; and other workers have confirmed this. Recently, Parnell² reviewed this question in the light of clinical experimentation into psychosomatic disorders. He found asthmatic and hay-fever sufferers to be mostly ectomorphs, and he suggested that the

narrow nasal passages and the predisposition to tension and anxiety of this type were aetiological factors. Sleep difficulties occurred most frequently in the ectomorph type, due perhaps to the nocturnal counterpart of their intense alertness by day. Digestive disorders—spastic colon, peptic ulceration, loss of appetite, vomiting, etc.—were widely scattered, but mostly in the endomorphic-mesomorph field.

The answer is by no means clear. The precise relationships between temperament, physique and disease proneness have yet to be worked out, but their importance cannot be disregarded. No extreme endomorph is ever likely to be a first-class rugby three-quarter, or to suit the vigorous life of a land surveyor. Therefore, in the matter of giving advice on choice of career or recreation, on mode of life generally, some knowledge of Sheldon's somatotyping is definitely advantageous. Whether we shall one day be able to diagnose a patient's trouble from his body build is something for the future to show.

REFERENCES

1. *Editorial* (1955): *Lancet*, 2, 291.
2. Parnell, R. W. and O'Neill, D. (1955): *Modern Trends in Psychosomatic Medicine*, chap. XI, p. 164. London: Butterworth & Co. Ltd.