ON THE ELIMINATION AND ASSIMILATION OF MORBID POISONS.

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THE distinguished author of the Address in Medicine recently delivered at Oxford, argues that recovery and subsequent immunity from such diseases as small-pox "are produced by a process of impregnation and assimilation, and not, as was early believed, and is still by some maintained, of elimination." Dr. Gull goes on to say that "the old theory of depuration, though true of gross chemical poisons, as lead, or mercury, or arsenic, appears to have no application to those operations which take place in the body in contagious diseases, as the effect of organic poisons." The question which is thus raised is one of considerable scientific interest and practical importance. I have been at some pains to arrive at Dr. Gull's meaning; and, so far as I can understand him, I find it impossible to reconcile his doctrine with some of the well-known facts of contagious diseases. Every pathologist will admit that in contagious diseases there is "impregnation" of the system by a poison; but what is meant by "assimilation"? Surely there is an entire absence of proof that morbid poisons are assimilated into the substance of the body as food is assimilated; and yet this appears to be the sense in which Dr. Gull employs the term assimilation with reference to these poisons. Without doubt, there is a process of assimilation in contagious diseases; but, so far from the organism assimilating the morbid poison, the exact converse occurs: the morbid poison assimilates the fluids and tissues of the body, and the result is a millionfold multiplication of the original poison-germ. What, then, becomes of these poisonous materials? That they are ever appropriated to the use of the body by a process of assimilation, is not only unproved, but in a high degree improbable. That they are partly decomposed in the system, and then ejected by various channels, is likely; but that, in such a disease as small-pox, they are abundantly thrown off into the surrounding air, is absolutely certain. The whole doctrine of infection is based upon the proposition that poisonous emanations from the sick may enter the bodies of the healthy, and there reproduce the morbid processes to which they owe their own existence. Not only does a morbid poison assimilate the materials of the living body, but an individual sick of an infectious disease makes others as sick as himself; he assimilates his friends and attendants. Our ignorance of the chemistry of morbid poisons does not render them the less veritable "chemical poisons". The every-day practice of disinfection in such diseases as cholera and scarlatina accords with the indisputable fact that a material virus is thrown off from the system. If the doctrine of the natural elimination of morbid poisons is to be rejected, the doctrine of infection and the practice of disinfection must also be given up, as unmeaning and useless, these corollaries being necessary correlatives of the other.

The fact that the organism is not restored to its former condition after such a disease as small-pox, so that, as a rule, it is insusceptible of a recurrence of the same disease, is rather adverse to than in favour of this new doctrine of assimilation. The body is *unlike* what it was before; it has been assimilated; and the non-recurrence of such diseases is more in accordance with the hypothesis of Mr. Simon and Mr. Paget, that certain ingredients of the body are destroyed by each specific morbid poison, and that these ingredients not being reproduced, that particular poison finds henceforth no materials upon which its morbid agency can work. Not only the skin, but the entire organism, is, as it were, permanently scarred by the operation of the small-pox poison.

I entirely agree with Dr. Gull, that "the object of medicine must rather be to limit the violence of attendant symptoms, than, with our present knowledge of therapeutics, to aim at arresting or neutralising their specific processes." It is questionable whether vaccination can with strict propriety be called a "remedy" for small-pox. I should consider it rather as a means of prevention, or of exciting a mild and modified form of the disease. Dr. Gull goes on to say: "Yet, notwithstanding this teaching, pathology still persists in looking in another direction; and therapeutics are governed by the idea that disease is an entity which must be combated and cast out." Now here I venture to suggest, that the idea of a disease is confounded with the idea of a morbid cause. My idea of small-pox is that of an individual suffering from that disease; and, if I found such a patient in one of my wards, my belief in the doctrine of the elimination of morbid poisons would induce me to "cast him out" of the ward before he had infected the other inmates. Then, in treat-

ing the sufferer from small-pox, I should act upon the idea that the small-pox virus is as veritable an "entity" as the ovum of a tape-worm; and, believing that the natural process of cure consists in casting out the poison and its products, I should endeavour to favour that process by a free current of fresh air to carry away the poisonous exhalations as rapidly as they are formed, and thus to prevent their re-entrance into the system either through the air-passages or by other channels. Again, in treating choleraic disease, theory suggests, and practical experience confirms, the theory that the foetid morbid secretions should not be retained within the alimentary canal, but rather permitted, nay, even assisted, to escape. One of the strongest theoretical arguments against the use of repressive means in the treatment of the contagious diseases is derived from the fact that these morbid poisons, unlike inorganic poisons, are rapidly self-multiplying; so that their forcible retention within the body increases their destructive agency. The mischievous consequences of driving in the rash of scarlatina are too well known to require even a passing notice. I lately saw rapid death follow the repression of the variolous eruption by a prolonged application of a cold wet sheet to the surface. In how many instances the analogous practice of arresting choleraic discharges by a large dose of opium has been attended with equally fatal results, it is painful to contemplate.

To sum up, then; the doctrine of the elimination of morbid poisons is based upon three classes of facts.

1. There are thrown off from the bodies of those who are suffering from infectious diseases poisonous materials, which have the power of imparting the same disease to others.

2. The processes by which these poisonous materials are thrown off from the bodies of the sick, are essential for the recovery of health, and an arrest of those processes is often followed by serious, and even fatal, results. In other words, while the poison escaping is destructive to others, the poison retained is destructive to the patient himself.

3. The most successful methods of treatment are such as rather assist than hinder those natural eliminative processes, which, being constant, are obviously an essential part of the cure. So that, to repeat the words of Dr. Gull, "the object of medicine should rather be to limit the violence of attendant symptoms than to aim at arresting or neutralising their specific processes."

ON SUN-FEVER:

OR DISTURBANCE OF THE CEREBRO-SPINAL FUNCTIONS
BY EXCESSIVE HEAT.

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EXCEPTIONAL seasons are frequently accompanied by exceptional pathological phenomena. One year we have cholera from some occult or unexplained peculiarity of season, coupled with a *virus morbi*; another, as the present, sun-stroke, or *sun-fever*, from the more simple cause of excessive solar heat and light. But the morbid results, interesting as they are at the moment, are soon forgotten in the changes of season and lapse of time; and therefore it is well that we should attempt to fix such phenomena as may be interesting in a practical point of view whilst they are still fresh in our memories. For this reason I make no apology for offering some notes from my own experience, supplementary in some sense in kind, as well as in number, to those of Dr. Bullar in the JOURNAL for August 22nd.

All who have watched the morbid effects of the late excessive heat will have perceived that those effects vary, from such slight disturbance of the functions of the brain or heart as often results from mere muscular fatigue, through all stages of severity up to those terrible cases of heat-apoplexy which we find recorded in the works of our Indian surgeons.

The following cases, selected from such as have come under my own notice this season, are intended to show that considerable variety may be looked for amongst cases of what may be called the minor sort of sun-stroke. They will be found to differ materially from those related by Dr. Bullar; and, of course, still more from the severe disease described as heat-apnoea by Dr. George Johnson in the JOURNAL for August 1st. It is from neglecting to estimate sufficiently this variation in the phenomena resulting from insolation, that so many errors are made in the diagnosis of sun-stroke.

Amid this variety of morbid results arising from the same cause, two features appear to stand out so prominently from the rest, as to entitle them to be looked upon almost as pathognomonic of a disease which may without great impropriety, I think, be denominated *sun-fever*. These features are both of a febrile nature, being a disturbance, first, of the cerebro-spinal, and, secondly, of the circulating function. All the