

## WHAT MANKIND MAY HAVE LOST THROUGH EVOLUTIONARY DEVELOPMENT:

### A MORAL ENTHYMEME.

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THE highly cultured product of twentieth century civilization—the moral philosopher—is accustomed to preen himself upon his glorious descent from what was a few million years ago a mere lump of primaevial protoplasm. He as a rule overlooks the compensatory advantages the leisured and lowly strollers along the broad road of evolution still enjoy. In the following paper I shall briefly recapitulate certain losses of fleshy attributes which mankind have presumably incurred, and the retention of which, at the present juncture, would in many cases have been unquestionably advantageous.

#### *Rejuvenescence of Hydra.*

Our flesh under favourable conditions possesses extensive powers of repair after wounds. These powers are, however, more or less restricted to approximating by fibrous or scar tissue the edges of gaps left by injury. Fibrous tissue is, as we know, the framework upon which our organs are suspended. It is a comparatively simple network of cells and fibres, and in its yoking functions it in many respects resembles the mesogial tissue of the freshwater polyp—the hydra. Here the resemblance ceases. The little zoid, whose ancestry extends (*pace* Debreit) presumably to palaeozoic times, has had to fend for itself throughout those many millennia; and from its own viewpoint it has not done badly. Evolution seems to have passed it by. The tubular body could not have been figured more simply than it is at present. Yet naturalists find this living jelly-bag to be endowed with extraordinary powers. It can be cut into a number of pieces, and provided both ectoderm and endoderm are represented, each piece will give rise to a complete hydra. Such vitality must on occasions be very serviceable.

If by mischance it loses the tentacular ring—the analogue of a head in some animals—it neither dies nor becomes hysterical, as certain excitable people do when they lose that seat of intelligence. No, it simply sits tight and grows another.

#### *Regrowth of Lost Limbs by Amphibia.*

The most enthusiastic supporters of the Darwinian theory of man's descent must admit that our relationship to the present-day coelenterate although possible is by no means proved. When, however, we attempt to trace our ancestry some few millions of years subsequently, we are much assisted in the investigation by noting the developmental stages of the human embryo, and by comparing these structural changes with anatomical peculiarities found in other members of the animal world. During the fourth week the human embryo possesses branchial clefts and arches, the latter surrounding oesophageal pouches, all strongly suggestive of aquatic life. Many of these relics of a far distant heritage are even now met with in both panel and non-panel patients. They are then distinctly abnormal, and, as pathological entities, more often than not come under the surgeons' knives. It was not always so, and we may doubtless assume that there was an era when these clefts and arches were necessary to the well-being of amphibian man, when he perchance led the life of the salamander and newt, "dreaming the happy hours away" at the bottom of some darksome pool. To compensate for this sloppy existence amphibia have wisely brought down certain fleshy attributes, doubtless from their mesozoic ancestors—attributes of which we may envy them the possession. One of the most important of these is the power of renewing a lost limb. Other members of the animal world also have this privilege, notably crustaceans. In these days of strife and stress, when fire and water play havoc with men's lives and limbs, limb regeneration and subaqueous respiration would be of inestimable value.

#### *Renewal of Skin.*

Ecdysis, or the ability to get rid of the outer skin at intervals, is a physiological operation regularly exercised by many animals. Among vertebrates it appears to have

fallen into disuse. A few, however, still retain the power, and among them the amphibia. Ecdysis is closely associated in crustacea, and probably in other creatures, with the privilege of regrowing a lost limb. The limb bud rapidly expands when the crustacean moults, and it soon attains the size of the full and complete limb. Apparently re-equipment with a new skin meant in certain cases something more than the assumption of a bran-new toggery. Besides the removal of blemishes, of abrasions, corns, and so forth, the moulting accelerated the regrowth of a lost limb. Civilized man who persistently removes an uncertain amount of scarf skin with his morning tub may be said to change his skin at intervals. Still, this piecemeal removal is unsatisfactory in many respects, and but poorly compensates humanity for the loss it sustained when its ancestors perchance ceased to cast off their old skins in order to drape their bodies in new ones.

#### *A Third Eye.*

Deep down in our brains, hidden amidst the fibres of the thalamencephalon, is a small body even now occasionally named the "pineal gland." It is regarded by naturalists with good reasons to be a sort of residual scrap-heap of what was once a functionally perfect median eye. Although the hot-headed phylogenic forbears of man long ago buried the remnants of the eye beneath the convolutions of a swollen brain, reptiles still have a "pineal eye" near the surface of the brain. Possibly the mesozoic ichthyosaurus, in whose fossilized skull a large cup-shaped opening (parietal foramen) is frequently to be traced, may have been a three-eyed monster, with a well-developed eye "right on the top of his forehead." I can imagine situations when such a median outlook would be valuable to a scout engaged in watching aerial raiders. The widespread prevalence of the pineal body among vertebrates leads one to think that at one time in the world's history a third eye may also have been widely distributed.

#### *Angels and Supplementary "Ribs."*

We are all familiar with the shape of the conventional angel of our artists and sculptors—the graceful human figure (usually female), with a pair of feathered wings fixed apparently to the shoulder-blades. Although we must, unfortunately, ban this type of human flyer as anatomically impossible, yet it by no means follows that none of man's daring phylogenic forbears ever strove to fly. Indeed, there is anatomical evidence to the contrary. The solution of the problem, whether the human body without serious alteration to its present integrity, could yet be structurally adapted to flight, will probably be found, if at all, in the animal kingdom. There is a certain volplaning lizard, misnamed "the flying dragon" (*Draco volans*), which has retained the art of gliding through the air, "yea, even unto the present day!" It does so by means of a broad membrane stretched over greatly prolonged hind-ribs upon either side of the body. Such an addition to the human figure, especially when the collapsed membranes were closely compressed against the flanks, would not be conspicuous, and might be occasionally very useful to aviators. It would, however, be necessary to rearrange our ideas of angelic shape. Indeed, the winged woman would then nearly resemble the property make-up of Mephistopheles in Gounod's *Faust*. Even now children are sometimes born with supplementary ribs.

#### *The Moral.*

In the life-history of the lower animals there are doubtless many other features which it would have disadvantaged man to copy. The above meagre selection must, however, suffice for the present. It now remains only to point a moral.

#### *The Grand Transformation Scene.*

Towards the end of the tertiary period a momentous change seems to have occurred in man's phylogeny. A race of shy frugivorous (?) quadrumana developed into slim omnivorous bipeds endowed with many human attributes. So far as the Eastern (Indo-European) branch of mankind is affected, this mutational change presumably coincided with catastrophic happenings upon the Austro-Malayan continent. Volcanic outbursts and land subsidence doubtless destroyed by fire and water many a tropic forest and inland swamp ere the great tongue of

land was eventually split up into the separate units of the Eastern Archipelago. Such mundane activity would naturally lead to the destruction of many indigenous animals and to the migration of others—among them the representatives of primitive man.

*When, How, and Why This was Probably Effected.*

One of the most momentous facts which geology strives to teach us is the enormous progress that has been made in complexity of the mammalian brain since the early tertiary period. Our slim prehuman ancestry with their comparatively big brains and puny limbs, when first they were called upon to change their mode of life and to conform their bodily figure and shape to new environment, were sorely handicapped in running the race that was set before them, and narrowly escaped dying out like other misfits of a somewhat like ancestral type (for example, *Sivapithecus indicus*, etc.). Fortunately for them, some of their more canny brethren had gained some knowledge of firesticks and of their value as weapons of defence (and later of offence) in combats with mammoths, cave-bears, or sabre-toothed tigers. The erect posture, the true worth of active upper limbs, and (perhaps *sub rosa*) the value of cautious night attacks on a powerful beast that could not see their puniness in the dark, yet whose flesh was tender and juicy when cooked, all assisted in teaching these early pioneers in the ways of humanity that most valuable asset of experience "how not to do things"! Their brains, driven through the mills of wild endeavour, gradually became more and more the dominating power to guide and overrule any attempts at independent peripheral muscular action when it is stimulated from without. As a result their prosencephalon, which eventually developed into what we now call the "hemispheres"—although they are certainly not half-spheres or anything near them in shape—began to lengthen along its long (antero-posterior) axis. So much so, that man soon literally "went ahead" of all the other mammals in this respect. In the dog, and in many (if not in most) other mammals the prosencephalon still sits astride of the older centres, leaving the rhinencephalon in front, and the "worm"—as they name the balancing centre of the cerebellum—behind uncovered by the hemispheric gyri. As the prehumans gained in "intelligence" they developed their prosencephalon more and more, until a day came when they buried first (possibly) the rhinencephalon beneath the weighty frontal convolutions of their microcephalic long-headed brains, and afterwards the "worm." They thus became the first representatives of humanity (as we now see it in the world).

This gradual change probably occurred just before the first glacial epoch. By this time eoanthropi (or Neanderthal men, or whatever name we may give to these first representatives of the human race), had not only passed over Asia, but had invaded Europe. The use of fire diminished the necessity their forbears experienced in obtaining their nocturnal knowledge of external nature by means of the sense of smell; their acquaintance with slings and darts, not of outrageous fortune, but rather of everyday life, required the intimate association of the judgement of the sight in co-ordinating the delicate movements of fingers and hands; hence probably came the stimulus to the development of neurones at first in the frontal region, subsequently elsewhere, as recent observers have apparently proved. When our long-headed ancestors had overrun the lush pastures of central Asia, had by their cunning subjugated many domestic animals, and had terrorized the remainder, the retention of that peculiar type of skull became yearly less urgent. In many places conditions favoured the survival of a race of pastoral nomads, with broader heads and less prognathous features than the others. The widening of the calvaria over the lateral regions, corresponding to the association areas of the occipito-parieto-temporal gyri, implied a corresponding development of brain tissues beneath them. Although the potential cerebral energy represented by these outgrowths of grey matter may have remained practically latent in some instances for generations, still their retention most likely modified the temperament of the possessor by making him a more peaceful, unemotional, not to say "stolid," person than he otherwise would have been without them. We now know that certain lateral gyri are intimately associated with the co-ordination of delicate movements

of the fingers, hands, and arms, such as are evoked by the eyesight in painting, or by the auditory nerves in playing music, and so on. The tending of flocks and herds does not on first thought seem a strenuous occupation; yet in those distant days it must have required a constant vigilance and, frequently, the active interference of the watcher with hands and arms to save his trust from marauders—at times, doubtless, the long-headed variants of his own species! Such occasional work for the neurones checked any tendency there may have been for these fresh outgrowths of cerebral convolutions to degenerate through disuse.

*The Conception of "Kultur";*

And so we find in early pliocene times two races scattered throughout the continents of the old world, and yet living side by side. It is easy to guess the result, especially as, according to my investigations, the priesthood was not invented until long after eolithic times; the result was miscegenation. Ever since the world has been fitted to support life, Dame Nature has apparently been trying experiments in moulding organisms to fit their environment by adaptive evolution. Judging from the bygone records of geology, we may admit that for a period some of them have been fairly successful; others have been undoubtedly failures through variously seemingly unforeseen causes. In many cases the creature unfitted for his surroundings, whether he be a solitary example or one of a race of misfits, after a period simply dies out, and his extinction is practically an unnoticed incident in life's turmoil. When, however, the Dame began to tinker with a man's brains, the feathers soon began to fly (metaphorically) and there was the Devil to pay (actually). The trouble began with miscegenation. So long as the microcephalic long-heads kept to themselves, their nocturnal habits, their sly and treacherous nature, were easily guarded against by their more intelligent round-headed cousins. When, however, it came to the marriage of little innocent cave-girls by the stalwart shepherds, and their offspring came into the world endowed with many of the racial characteristics of both parents, crucial difficulties at once began to arise, difficulties which have remained even unto the present day.

*And its Birth.*

We must pass adown the silent corridors of time a few millennia ere we can judge the effect of this commingling of brains upon the current history of mankind. At what period the Accadians, probably a Turanian offshoot, took possession of the fertile district along the Euphrates valley is unknown. They were probably an industrious race of agriculturalists, and judging from what we know of the Mongols and other nomad Asian races, were presumably more or less a round-headed race. About B.C. 8000, the intermixture of brain-pans was probably much less widespread than it now is, and pure-bred round heads were more common. However that may have been, it is certain that soon after that date a great empire was founded and cities were built in the district. Now, knowing what we do of miscegenation in modern life, it would be even betting that the empire founders were another race of humanity, who conquered the original inhabitants; and, furthermore, that the former race had probably more than its share of "original sin"—whatever that may mean—implanted by its nameless parents in its blood. Such was probably the case. The Semites (who, by the way, spoke a language beautified by gutturals) were a noble and imperious race proud of their lineage. They were also highly religious, and spent their time seemingly in fighting other races and in propitiating their own gods. By such means they consolidated the great Babylonian empire, probably the first of its kind that the world ever saw, but by no means the last. According to Mendelian theory, smallness in stature is recessive and bulkiness a dominant character. So far as skulls are concerned this theory holds good. The modern pigmy tribes are, I believe, in a majority of cases microcephalic long-heads. On the other hand, the bigger dominant races may, according to Mendelian laws, subdivide themselves into various classes according as they partake more or less of the latent (recessive) characters of the dwarf. The Semites who patronized the arts—so long as the sycophantic artist lauded his patron—lived in clover, taking, at the same time, care that that fodder should be cultivated by the



original possessors of the soil. In fact, they had all the qualities of a domineering, not to say dominant, race, and the features of their kings and lords, as handed down to us by their stony effigies, show many of the characters of the mesocephalic long-head. This, then, was the race who first evolved from the recesses of their brains how to lead an easy life by militarism and "kultur."

### THE EARLY TREATMENT OF PROJECTILE WOUNDS BY EXCISION OF THE DAMAGED TISSUES.

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AFTER eight months of experience of the early treatment of projectile wounds I have had ample opportunity of critically observing the values of the various antiseptics in their various strengths and also the many details of treatment of recent wounds. I desire, therefore, to place on record a method of treatment which has given most gratifying results, and which, if practised thoroughly, will materially lessen the time a wounded man is absent from the firing line.

In a modern projectile wound we have to deal with a varying amount of devitalized tissue and a varying amount of ingrained infected material, both of which are always present. The devitalized tissue varies in different wounds from a microscopical amount, through all quantities, to the gross obvious slough. The ingrained infected material is inseparably fixed to this devitalized tissue, and nothing short of the complete removal of the tissue can possibly get rid of the infected matter. Cleansing measures are placed at a great disadvantage, for only those organisms which are spread loosely broadcast on the surfaces can be removed or inhibited in growth by antiseptics. The more important natural protective powers of the healthy body in which these wounds occur are also placed at a great disadvantage, for no vigorous opposition can be offered by devitalized tissue, and the healthy tissue is separated from the loosely scattered infected material on the surface of the wound by the layer of devitalized tissue bounding the wound, and this tissue also acts as a perfect culture medium.

#### The Method.

This consists in the extirpation of the devitalized tissues. An anaesthetic is given where indicated:

- Local anaesthesia by novocain and adrenalin 2½ per cent.
- Short anaesthesia by open ethyl chloride method.
- Long anaesthesia by ether or chloroform.

The wound of the skin is boldly cut out with a sharp scalpel. It should be so completely removed that a clean healthy incised wound replaces the contused and infected wound made by the projectile. There should be nothing of the old wound remaining.

The wound of the superficial and deep fascia should be treated in the same way.

The wound of the muscle is dealt with in the same fashion. It presents, however, more difficulties because of the retraction of severed fibres, and because of the distance of the depths of the wound from the surface of the body. This latter difficulty can be happily overcome in many cases by making larger incisions.

Removal of loose and fixed bits of obvious foreign and dead matter is, of course, essential. Ample exposure and drainage of the wound is necessary, and those wounds which are too extensive after the above treatment to retain a drainage tube do better than those in which a tube is necessary on account of their depth and narrowness. By this procedure the wound is put in the best possible conditions for the bactericidal actions of the tissues and the outpoured lymph. It is important to remark that it is not wise to impair the resisting and offensive powers of the artificially obtained healthy tissue surfaces by the use of strong or injurious antiseptics.

#### Results.

This method, when combined with the surgical essentials of perfect rest, cleanliness, and frequent suitable dressings,

has resulted in the healing of projectile wounds, without any appearance of pus in wounds of the skin and of the superficial fascia. In many wounds of muscle and bone, also, this gratifying result has been attained. In the treatment of some wounds of bone and muscle anatomical problems have prevented these principles of treatment from being thoroughly carried out, so that the results have not been as good. There have been no cases of generalized blood infection, nor of any spreading infection in the neighbourhood of the wound.

### NON-TUBERCULOUS HIP DISEASE SUCCESSFULLY TREATED BY DOUBLE SPLINT AND OVER-ABDUCTION.

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THE case which was subjected to the treatment below described was sent to Liverpool by Dr. Sugden of Ramsey, Isle of Man. The illustrations are admirably drawn from photographs.

A girl, aged 6, was admitted into the Liverpool Royal Infirmary on June 8th, 1903. The left hip was disabled, swollen, and tender, but gave no pain as long as she lay quiet in bed. The condition started with pain nine months previously, and she had been lame for six months. The pelvis was strongly arched and tilted to the left, and the limb abducted and rotated outwards. There was a conspicuous feature on manipulation—an extraordinary looseness of the hip-joint whereby the left thigh could be adducted so as to lie at right angles across the right. She was measured for a double Thomas's hip-splint as modified by Robert Jones, with extra abduction on the affected side and the ends prolonged, as shown in Fig. 1. This was applied, under chloroform, on June 18th,

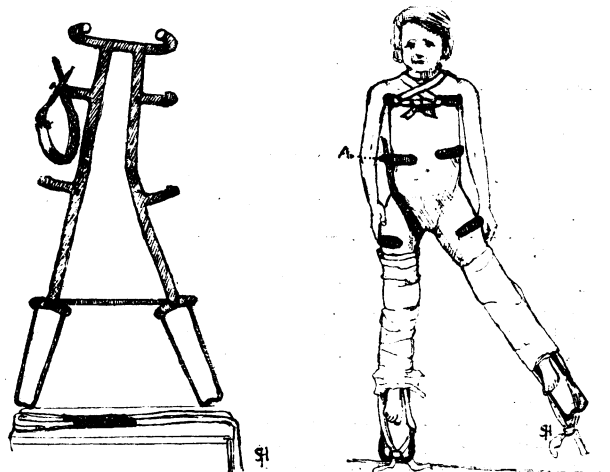


Fig. 1.

Fig. 1.—Double hip splint, with extra abduction on left side. Leather perineal band for sound side attached to stud on loincrescent. (See also Fig. 2.)

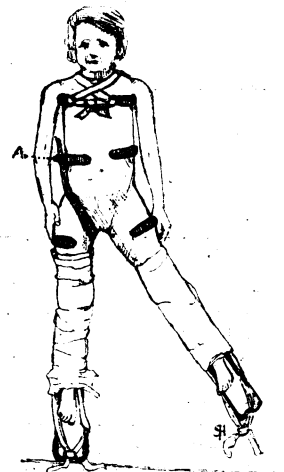


Fig. 2.

Fig. 2.—Child erect in splint. Front view, showing bandage slinging it to neck. A, Stud to which strap is fixed.

1903, both lower limbs being thickly surrounded with rolls of cotton wadding and bandaged to the splint. To prevent shifting, each leg was previously prepared with two strips of bandage stuck on with doubled adhesive plaster fixed under a roller bandage, and tied to the ends of the splint beyond the feet. For counter-extension a perineal band covered with basil leather was looped on the sound side, and its ends—leather straps pierced with holes—were buttoned on a couple of metal studs attached to the splint, as shown in Figs. 1 and 2. Between the patient's back and the bars of the splint was a flat pad covered with basil leather. Fig. 3 shows also the portability of the patient in her splint, without fear of displacement or interruption of the fixed and comfortable mechanical treatment. She could, whenever tired of lying on her back, be turned over so as to lie on her face. The invariable tendency to "adduction deformity" on recovery from severe hip disease is thus counteracted by "over abduction" at first, the result being eventual return to the straight position.

Some pain was naturally inflicted by the forced adoption of this attitude, but quickly subsided under the fixed rigidity of the splint. Still the evening temperature, though sometimes returning to normal, generally oscillated in the first few weeks between 100° and 102° F. The front of the joint became puffy, and after seven weeks fluid elasticity could be felt. On