BRITISH MEDICAL JOURNAL

LONDON SATURDAY APRIL 18 1953

MAGIC, MEDICINE, AND RELIGION

THE PERSISTENCE OF AN IDEA*

BY

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Although the probable age of the world and of living matter has been the subject of many estimations it would be unsafe to assume that they are even remotely correct. Our knowledge of anything in prehistoric days is highly conjectural, and history itself is a peculiarly inexact science even if it does not warrant the dictum of Mr. Henry Ford.

It is impossible to say when man arose, but relics of manlike creatures who lived about half a million years ago have been found in divers places. Somewhere about 50,000 years ago Neanderthal man flourished, leaving many indications of his artistic and medical skill and of his belief in an after-life, as shown by his method of disposal of the dead.

About 10,000 years ago man began to cultivate crops and to breed animals, and from that date a good deal of evidence has accumulated about his activities and beliefs. Nothing very definite could be learned, however, until some method had been devised for recording his experiences, devices which arose, strangely enough, in several different parts of the world at approximately the same time—namely, about 5,000 to 6,000 years ago. Since then we have acquired a considerable knowledge of his affairs, especially from Egyptian and Mesopotamian sources.

Disease is as old as living matter. Evidence of its presence is found in prehistoric fossil bones, and indeed one of the earliest evidences of disease in humans or manlike creatures was found in the femur attributed to the Java man, which Keith considers to be about 350,000 years old. From that time onwards much evidence of disease has been found, particularly in material from the Nile Valley, where the dry climate, together with the methods of disposal of the dead, has had a preservative effect. Evidence of disease has been found not only in the bones but also in the soft tissues,¹ and in addition to signs of various pathological processes it is interesting to note the prevalence of osteoarthritic changes and arteriosclerosis in those remote periods, which indicates that we are not necessarily correct in attributing such processes to the stress and strain of modern life.

Primitive Medicine and Religion

We may take it that disease of some kind has always afflicted man and must have led him to search for means of easing pain and curing disability. In his quest for

food he had to discriminate between things that were good for him and things that were not. By process of trial and error he obtained not only dietetic acumen but also knowledge of drugs which had a beneficial effect in disease, drugs which prevented pain, and drugs which were capable of causing death. In course of time this skill in the use of drugs became the special province of certain individuals, and by it they were able to exercise power and authority in the community. These were the original medicine men, but it would be wrong to think that they relied on drugs alone in the treatment of disease. If the condition was simple or the cause of it apparent, no doubt such herbs or simples as were available were used, together with primitive surgical procedures, but we must remember that many disabilities have no obvious cause, and for the treatment of those other methods had to be devised.

To-day we regard disease as being subject to natural laws, but before such laws were known it surely was reasonable to assume that phenomena which could not be otherwise explained were due to the action of some supernatural power. For example, the sudden onset of pain, the eruption of a fever, the convulsions of epilepsy, etc., had to be explained in some way, and in default of any natural explanation they were assumed to be due to the action of demons who had gained entrance to the body or had forced something of a toxic nature into it. Assuming this to be correct, the logical response was an appeal to a higher power to curtail the activities of the demon, to drive him out or destroy him. This entailed appeal to higher supernatural powers, and thus arose the priest, whose functions were closely associated with or were performed by the medicine man.

The fundamental aim of primitive religion as of primitive medicine was to safeguard the life of the individual, and, to effect this, steps were taken which were strictly rational, although they may have been based on false premises; hence, from the earliest times religion and medicine had similar objectives—medicine endeavouring to control natural processes by natural means, religion trying to control the same phenomena directly by appeal to some higher power. In addition, certain rites and procedures were used to combat disease, the efficacy being inherent in the rites themselves or in the user, and this constituted magic. Medicine, religion, and magic, therefore, have been associated since the beginning and have worked together for the alleviation of human suffering.

*A Finlayson Memorial Lecture delivered before the Royal Faculty of Physicians and Surgeons of Glasgow on December 10, 1952.

¹Palaeolithic Pathology of Egypt, by M. A. Ruffer. 1921.

Egyptian Theology and Medicine

In Egypt, in quite remote times, there was not only a very advanced state of culture, including a well-developed system of medicine, but also a remarkably complicated system of theology. All varieties of sickness and disability were attributed to the action of gods, certain of whom had health and disease as their special responsibility. Health depended to a great extent on paying proper attention to the edicts of these gods and propitiating them with offerings. Even after death the comfort and well-being of the dead depended on such propitiation. The Books of the Dead deal in great detail with the judgment after death, the "weighing of souls" as it was called, and the various proceedings in connexion with the passage of the soul through the underworld. There was therefore, from a very remote period of history, a strong belief in the power of the gods during life and in their authority after death, for belief in existence in some form after death seems to have been present since human life began. It is interesting to note that in the trial of souls, although Osiris sat in judgment with a court of lesser gods, there is a suggestion that over and above them all there was a supreme being. This idea of a day of judgment has remained a part of human beliefs.

In addition to the inscriptions on tombs and temples a number of medical papyri have been discovered, the two most important, and probably the oldest, being the Ebers Papyrus, which is mainly medical and magical in its outlook, and the Edwin Smith Papyrus, which is surgical and rational. The Ebers Papyrus contains sections dealing with various diseases and their treatment, concerning which it shows quite a remarkable standard of knowledge. Throughout the manuscript, in addition, there are directions for the use of incantations, invocations to the gods, and the words to be recited when healing a patient, indicating the important place of religious and magical procedures in medical treatment, though there is a suggestion that the incantations may have been used to reinforce the action of the drugs and not for the value of the magic alone. Even when knowledge of the uses of drugs became more profound, medical treatment by the doctor, spiritual treatment by the priest, and magical treatment by the sorcerer continued to be used side by side in active collaboration.

The Edwin Smith Papyrus is a surgical treatise and deals in a common-sense way with lesions of a traumatic nature, beginning from the head and working downwards. The diagnosis, prognosis, and treatment of fractures, dislocations, and wounds; the effects of injuries on the brain; and the processes of healing are dealt with in a skilful manner. The method of reducing a dislocation of the jaw, for example, is the method in use at the present time. The suturing of wounds, the use of adhesive plaster for bringing the edges of a wound together, the use of properly padded splints and other retaining apparatus, a very efficient system of bandaging, and various other surgical procedures are described, indicating a fairly high degree of medical knowledge. There is one case only in which an incantation is used. The treatise as we have it is a copy of an ancient work and unfortunately is incomplete.

Breasted hazarded a guess that the original work from which the papyrus was copied was written about the time of the pyramid-builders, about 5,000 years ago, and possibly was used by Imhotep himself. Imhotep was the earliest physician that we know by name, and combined the offices of Chief Physician, Chief Magician, and Chief Vizier to Zoser, the Pharaoh of the Third Dynasty. He was also the architect of the Step Pyramid at Sakkara, the first important public building of which there is any record. Though we have little information about his medical activities we do know that his name was revered for about 3,000 years, which is rather longer than most reputations last, and, more

important from our point of view, numbers of temples were erected in his honour, where treatment of the sick by incubation or temple sleep took place. We may look upon him as the founder of psychotherapy. By the time that Egypt was conquered and overrun by the Greeks, about 300 B.C., the worship of Imhotep was general throughout the land, and the temples erected in his honour became seats of medical science and instruction.

We note, therefore, not only that the Egyptians had a relatively advanced system of medical treatment, but also that magical and religious procedures and cults existed side by side with rational medicine from the most ancient times of which we have any knowledge. In other places where there are medical records, such as in Sumeria, Babylonia, and other Eastern countries, the same relationship of religion, magic, and medicine is found.

Among the ancient Hebrews medicine as a science did not exist, and disease was looked upon as a punishment for sin which incurred the wrath of God. There appears to have been little use made of ordinary medical practices, although physicians are mentioned in the Scriptures, and the hygienic and sanitary code evolved by them was unique and masterly. Healing seems to have been the province of the priests, and possession and exorcism were of importance. The healing pilgrimage of Christ and the diseased conditions which he is recorded to have cured must have appeared miraculous. Many of the cures described by St. Luke, such as the cure of epilepsy, of chronic arthritis, and of dropsy, the cleansing of lepers, the casting out of devils, the cure of the dumb and the blind, are all strongly suggestive of actual cases, and it is a question whether Christ should be looked upon as a psychotherapist of remarkable ability or whether he was in fact possessed of divine powers. It would be unsafe to assume that the diseased conditions which he healed were all psychogenic in origin. Many of the miracles may perhaps be explained on that assumption, but certain of the cures cannot—for example, the immediate cure of a withered hand² and of a case of leprosy,³ and the restoration of a dead person to life.⁴ These cannot be explained as the result of psychological treatment, but must be attributed to something beyond our understanding.

Developments in Greece

The Greeks were no doubt impressed by the standard of medical knowledge in Egypt and particularly by the success of the religio-magical treatment by incubation in the temples of Imhotep, and as a result many such institutions were established in Greece. Not only was the system of temple healing adopted, but it is also suggested that the name Asklepios, the Greek god of healing, was derived from Imhotep. Certainly in Egypt after the Greek conquest the two names were used indiscriminately, and many of the temples founded by the Greeks in honour of Imhotep were called Asklepieia.

In early Greek medical practice emphasis was laid on the religious or spiritual element, and the importance attached to incubation or temple sleep is shown by the fact that in and about the eighth and seventh centuries B.C. there were erected something like 300 of these temples, dedicated to Asklepios. The most beautiful of these was situated at Epidaurus, where in addition to the central shrine and abaton, or sleeping-place for the sick, there were baths, hostels, and gymnasia, as well as a large theatre and stadium.

On arrival at the temple the sufferer was subjected to a ritual which predisposed him to suggestion. After bathing in the cleansing waters of the fountain he was admitted to the porch of the temple, where he spent one or two days in prayer and meditation. This period, which would exert a soothing influence on his mind, was followed by sleep in the abaton, where the depth of sleep may have been assisted by narcotics. During sleep the god appeared to the sufferer, and quite often a cure was effected overnight. More frequently it required several days of treat-

²Luke vi. 10. ³Luke v. 13. ⁴Luke vii. 12.

ment by incubation supplemented by baths, massage, gymnastics, and strict dietary measures. The inscriptions round and about the temples and the number of votive offerings indicate that many cures resulted.

About 460 B.C. there was born in the island of Cos a man who was later to become the greatest of all physicians—Hippocrates. In Cos at that time there was a temple and shrine dedicated to Asklepios to which thousands of sick people resorted. The family of Hippocrates was associated with the temple, and the youth no doubt acquired at an early age a training in medical methods. In the fifth and fourth centuries Greece had remarkable efflorescence of genius in arts and science, in philosophy, history and drama. I need mention only Herodotus, Sophocles, Pheidias, Socrates, Plato, Aristotle. It might therefore have been expected that a great medical man would arise. With the advent of Hippocrates there began a rational system of medicine in which disease was dealt with as a natural phenomenon due to disordered processes in the body itself, and treated by paying particular attention to all the conditions which tended to preserve health. When disease occurred, the natural forces of the body were encouraged to effect a cure. All magical and religio-magical methods were dismissed, as well as the idea that disease was a punishment for sin. Even in connexion with epilepsy, which was always spoken of as the "sacred disease," Hippocrates said, "It is not in my opinion any more divine or sacred than any other disease, but has like them a natural cause and its supposed divine origin is due to man's inexperience."

The system of faith healing and magic in the temples continued, however, throughout the Hippocratic era and well beyond it, and it is difficult to credit that Hippocrates attributed no importance to suggestion in his treatment, even though he did not believe in direct divine intervention. Speaking of the way in which doctors attribute the phenomena seen in epilepsy to divine causes, he says: "In treating sufferers from this disease by purification with blood and like things they behave as if the sufferers were ritually unclean, the victims of divine vengeance or of human magic or had done something sacrilegious. It would have been better if they had taken the sick into the temples, there by sacrifice and prayer to make supplication to the gods. I do not believe that the body can be polluted by a god, but if it is polluted by some other agency the presence of a god would be more likely to purify it, for it is the deity who purifies, sanctifies, and cleanses us from sin." This suggests that Hippocrates by no means discarded the importance of the temples in the healing of the sick. He considered that most diseases were to be cured by restoring the disturbed harmony in the elements and humours of the body, such restoration being carried out by the powers of nature aided by the physician, who removed any disturbing factors. Before the Hippocratic era, Alcmaeon of Croton, a pupil of Pythagoras and contemporary of Empedocles, had already introduced the doctrine that health depended on the harmony of elements within the body and disease upon their discord. Though Hippocrates betrayed no enthusiasm for drugs, he had quite an extensive pharmacopoeia at his disposal, and many of the drugs in use then are still used.

In this wonderful period of Greek development, therefore, we find that healing by the use of drugs, by physical means, and by religious and magical procedures existed side by side. In this regard it is to be noted that in 380 B.C. Plato recognized the importance of the mind in healing. Through one of his characters, who was a physician, he said: "The cure of a part should not be attempted without the treatment of the whole. No attempt should be made to cure the body without the soul, and if the head and the body are to be healthy, you must begin by curing the mind." I shall refer to this view later when dealing with the importance of the mind.

After the death of Hippocrates about 350 B.C. medicine gradually fell from the high standard set up by him and his

followers, and the air was full of turmoil and disputation. Philosophic argument again asserted the sterilizing influence from which Hippocrates had rescued it, and in the following eras the Dogmatists, the Empiricists, the Methodists, the Eclectics rose. These sects were very dogmatic, very rational, very argumentative, and no doubt added zest to living by their scholarship; but they were of little value in progressive medicine and showed little sign of attention to psychological medicine. Aristotle (384–322 B.C.) closely followed Hippocrates, and, though not a medical man, exercised a profound influence on science generally, and as a biologist his work was of great importance to medicine. It is of interest that he also believed in the importance of balance in the humours of the body in the maintenance of health.

The Roman Attitude

In passing into the early years of the Christian era it is of interest to note what Seneca (3 B.C.–A.D. 65) thought about those things of the spirit which we have been discussing. In his *Quaestiones Naturales* he wrote: "There are many things akin to highest deity that are still obscure. Some may be too subtle for our powers of comprehension, others imperceptible to us because such exalted majesty conceals itself in the holiest part of its sanctuary, forbidding access to any power save that of the spirit. How many heavenly bodies revolve unseen by human eye! . . . How many discoveries are reserved for the ages to come, when our memory shall be no more, for this world of ours contains matter for investigation for all generations. . . . God has not revealed all things to man and has entrusted us with but a fragment of His mighty work."⁵

These are noble words, and had the Roman attitude to religion, science, and medicine been consistently inspired by such sentiments, then Rome would surely have added a fuller measure of glory to her undoubted grandeur.

In Rome, however, indigenous medicine was never of a high standard, although the infiltration of Greek physicians and Greek writings exerted a favourable influence. Celsus in medicine and Dioscorides in materia medica stand out in this connexion. These two were followed by the colossal figure of Galen, whose views dominated medicine for centuries. Galen, though a master in the use of drugs, was well aware of the importance of the mind in treatment. "We have proof," he said, speaking of temple cures, but prophetically withal, "that many serious illnesses can be cured solely by a shock administered to the mind."

Galen was the last of the great ancient physicians. Even before his death in A.D. 200, and more so afterwards, the level of medical practice in Rome was distinctly low. The city was full of quacks, charlatans, poisoners, and magicians. Both the worlds of which I have been speaking were represented—the realm of magico-religious healing and that of systematic medical practice—but Rome made the best of neither. The genius of Rome lay in other directions and its power was waning.

The adoption of the Christian religion effected little or no improvement in the healing arts. Indeed, in some ways it was disastrous, for it appears to have favoured positive fixation at a low level instead of a negative stagnation, in which some stir and upsurge might eventually have developed. In A.D. 360 Basil, Bishop of Caesarea, insisted that disease was a manifestation of divine purpose and action, effected by means of demons, and indicated that the Church would look with disfavour on treatment by any means other than prayer.

A Vanishing Inheritance

By the seventh century the scientific attitude and the cultural inheritance from Greece were in process of vanishing. Theodosius decreed that Christianity and paganism could not both exist in the empire, pagan rites were prohibited and pagan temples destroyed, including the temples of

⁵From *Magic to Science*, by Charles Singer, 1928. Benn, London.

Asklepios, where the incubation ceremonies were competing successfully with the Church's own saints and shrines.

Not only was science in a moribund state and discouraged by the Roman Catholic Church, but there was also a falling away in the genuine faith healing which was a feature of earlier pagan times. The teachings of Hippocrates were forgotten, and even the influence of Galen became subversive on account of the unquestioned authority which had to be accorded to his written word.

For a thousand years or so there was no real progress in medicine or science, nor any advancement in the knowledge of the mind and its disabilities. The dominance of the Church, with its hostility towards science and intolerance of anything unorthodox, had a reactionary influence. A ferocious tenderness towards the true faith led to dreadful attempts to save the soul by torturing the body. Witches and heretics were destroyed, not only for the safety of the Church, but also for their own good. Dogma and religious observances were of paramount importance, and the needs of the body and its reaction to disease became relatively insignificant. Against this disastrous catalogue, however, there can be set at least one redeeming feature, and it is one of importance. The Christian belief in charity, not always easily discernible in action, did lead to a greater appreciation of the propriety of caring for the sick and needy. This was a Christian virtue which coloured the whole outlook of medicine when it did eventually emerge as a progressive discipline after the long depression of the Dark Ages. Fortunately the flame of science was never quite extinguished, and something of its true spirit remained alive, notably in that strange flowering of civilization among the Arabs, through whom much of the ancient learning returned to Europe and led to the Renaissance there.

It is a curious circumstance that this revival in Europe should have been partly due to the fact that the Nestorians, who were driven from Constantinople and expelled from Church and State, devoted themselves to Greek scientific writings, which they transmitted to the Persians. There they were translated into Syriac, retranslated into Arabic, and eventually translated back again into Latin, and thereby gave Europe its first access to Greek science when men's minds began to waken after the Dark Ages.

Throughout the Dark and Middle Ages Anglo-Saxon medicine was of a very primitive nature, and the magical element predominated. The Teutonic peoples had not the same belief in possession by demons which was characteristic of the Near East, but attributed many diseases to the action of elves and witches who fired baleful shafts into the body. It is pretty clear, however, that other early and mediaeval Christians accepted the doctrine that disease was due to the action of demons. St. Augustine, in the fifth century, said, "All diseases of Christians are to be ascribed to demons, chiefly do they torment the fresh baptized, yea, even the guiltless newborn infant." Under these beliefs those suffering from disease of any kind were subjected to various procedures for driving out devils, such as prayers to the Almighty God, the exposure of the sufferer to holy relics, and the laying-on of hands by a member of the Church. Medicine reverted to a form of healing which was in vogue a thousand years before Christ.

A Great Awakening

From the fifteenth century onwards there was a great awakening of the scientific spirit and improvement in the methods of treatment in comparison with those of the earlier ages, though it must be confessed that medical practice remained in a shocking state of ignorance for a very long period and only gradually approached the Hippocratic standard.

Throughout this period methods of healing by suggestion or by divine intervention continued. In addition to the healing methods already described, succeeding centuries saw the advent of newer methods of suggestion such as mesmerism, hypnotism, couéism, Christian Science, and so on, all

of which contributed in some degree to our knowledge of the effect of the mind on the body, and have led to a more scientific approach by the methods of Freud, Jung, Adler, and our modern psychologists and psychiatrists.

This brief outline of medical thought over the ages has clearly shown the close association of medicine, magic, and religion throughout, and, though the conception that disease is due to natural causes has gradually matured, man has never lost his belief that there is something beyond human knowledge which may either cause disease or cure it. We have seen the application of these beliefs in the temple treatment in Ancient Egypt, in Greece and Rome; in the exorcism of devils; in healing by anointing and by the laying-on of hands; in healing by animal magnetism and mesmerism; in healing by visits to holy shrines or exposure to holy relics; in healing by Christian Science, by psychotherapy, and by prayer and intercession by ministers of religion. It may be that all the people have been wrong all the time, but that would be an unsafe assumption on which to formulate a policy of investigation.

All of these forms of healing have been shown to be of service in combating disease, and there is no doubt that they are effective in certain cases. It is of interest, therefore, to consider how these beneficial results are produced; whether there is some common factor operative in all of them, and, if so, whether it can be defined in the light of the knowledge which we possess. In considering this problem I do not intend to enter the arena of metaphysics or discuss the possible intervention of a divine power, but to confine myself to the question whether these results are associated with definite physical phenomena in the body.

Modern "Miracles"

First, with regard to magic and miracles we should remember that many things which are accepted as commonplace to-day would have been considered miraculous not so many years ago; of these, radio and television are outstanding examples. But, apart altogether from the apparent miracles due to the application of physical science, there are many methods of medical treatment in common use to-day which produce results that would have appeared miraculous 100 years ago. For instance, when the first cretin was given thyroid gland, when quinine was first used in malaria, or when the first patient received a dose of opium, the results appeared to be miraculous then. Not so long ago myasthenia gravis was considered to be an incurable disease with permanent muscular dysfunction. A dose of neostigmine, however, causes immediate recovery of muscular power; when a sufferer from severe asthma receives an injection of adrenaline immediate recovery may occur; when cortisone was first used on arthritic cases it appeared to give immediate relief in those permanently crippled.

These cures, temporary though they may be, are quite as impressive as some of the early miracles of healing. The control of bacterial activity by penicillin and other antibiotics, and the almost immediate relief from suffering by their use, have all the appearance of magic or the exorcism of devils, the devils in this case being infective bacteria. It is to be noted that in the exorcism of devils the operator was enjoined to keep his mouth shut on account of the ease with which the demon might make an entry into his body. This is reminiscent of the modern practice of wearing a mask to keep the bacteriological demons in or out as the case may be.

The modern miracle whereby persons suffering from certain diseases of the mind are treated by shock therapy is reminiscent of the old practice of exorcism, for whether the demon is forced out by certain rites, whether it is let out as it was in ancient days by trephining a hole in the skull, or whether it is driven out by the passage of an electric current through the brain seems to me to make very little difference so far as science is concerned. In each case something is done of the nature of which we know little, and something happens of the nature of which we know less, and a "cure" results—temporary, perhaps, but a cure.

Much more could be said about these matters, but I hope to have made the point that a miracle at one period of time may be a normal method of treatment at another, depending upon the knowledge available at the particular time.

Before dealing with the method of action of the various forms of so-called faith healing or healing by suggestion, let us consider on what health and disease depend. The answer must be that health depends on the accurate, harmonious, and constant co-ordination of an enormous number of factors in the human organism, some of which we have cognizance of, such as the endocrine balance, the electrolytic balance, the correct proportion of metallic elements, the proper balance of protein and non-protein constituents of the tissues and fluids of the body, the control of the body temperature, blood glucose and oxygen levels, and hydrogen-ion concentration, and on the efficient removal of waste products of metabolism. We have little precise knowledge of how the accurate balance of all these substances is maintained, but we do know that derangement of whatever nature may throw out of harmony the whole system and cause ill-health.

This may be the result of definite physical causes, as by deprivation of essential substances, by traumata, or by infection, but, what is more important for our present discussion, it may be a result of mental processes.

Body-Mind Relationship

That definite physical phenomena can be caused by mental processes or emotion is well known. For example, anger may cause the blood pressure to rise; fear may cause it to fall; pity may produce the secretion of tears; excitement may produce insensibility to pain, terror temporary paralysis; fear may cause increased secretion of urine, increased peristalsis, and increased sweating. These physical phenomena are all produced by emotion and may be observed in the absence of any external stimulus.

The state of the mind, therefore, may alter the body functions, and if health depends on their continuous harmonious relationship anything which disturbs that harmony may cause ill-health, whether the disturbance arises from known physical or mental causes or otherwise.

That being so, any form of treatment which might lead to the restoration of harmony is apt to have a beneficial effect. It may be that this adjustment can be effected by everyday medical or surgical treatment, directed towards a definite physical cause. It may be that physical manifestations produced as a result of some troubled state of the mind may be successfully treated only by restoring harmony to the mind.

Here, then, may be the explanation of the effects common to the various procedures, religious, magical, psychological, etc., which we have been considering. All of them are directed towards the restoration of the harmonious relationship in the functions of the body through the removal of some source of disharmony in the mind. This may result from so-called psychotherapy, but it may also be the result of prayer or of faith in a divine power or in the doctor, or in the drug that is used, or, in fact, in any of the procedures that we have been discussing. We have all seen the improved physical condition of patients which sometimes results at once from the visit of the doctor—an improvement in the general condition which is often accentuated when an examination of the body takes place by "the laying on of hands," and most of us, I have no doubt, have witnessed the beneficial effect of prayer. By whatever means the effect may be induced, the troubled mind seems to be calmed and harmony restored. We have been accustomed to think and talk of "psychogenic conditions" and certain diseases of an organic nature which have been described as "psychosomatic" in origin, but I want to suggest the possibility that disturbance of harmony in the body-mind relationship may be a contributory factor in producing ill-health of any kind, and that the terms psychogenic and psychosomatic are simply convenient labels for the

moment; for if worry may cause a peptic ulcer to occur it may equally well lead to the breakdown of resistance to tubercle or other pathogenic organism, and cause a general upset or a so-called nervous breakdown.

We should picture mind and body working continuously together and mutually dependent, so that any slight alteration in the rhythm of the one is at once reflected in the activity of the other. We see health as the normal outcome of this harmonious relationship and disease as the result of disharmony. It is unlikely that we shall be able to observe an early fault in this relationship until we evolve new methods of investigation, and it is to my mind certain that in such early perception lies the root of preventive medicine. By the time that we can observe signs of what we call disease the tissues have undoubtedly sustained physical damage, which may have reached the stage when restoration of harmonious relations may be a matter of difficulty or even of impossibility.

It seems to me, therefore, that much of the future in medicine lies in obtaining better knowledge of the relationship of the mind and body in the maintenance of health. We must know more about the way the balance of various substances is maintained, to what extent the mind affects the control of the bodily secretions, whether there is in fact any recognizable physical change produced by different mental or emotional states, and whether any physical or measurable effect can be produced by prayer or other forms of healing here discussed. If any deviation from the normal can be recognized early enough, we must ascertain how an adjustment can be made before physical damage occurs. In short, it seems to be essential to study these matters and conduct our researches as we have done in connexion with physical sciences.

Conclusion

We have seen, within the last decade or so, such advances in our knowledge of the structure of matter and the relationship of matter to energy that the borderline between living and non-living substances has almost disappeared, and we can expect at no remote period to hear that living matter has been produced in our laboratories. During that period we have seen something of the intricacy and interrelationships of the sex hormones in connexion with growth, of the number and complexity of the enzyme systems essential to the life of the cell, and of the importance of the endocrines individually and in relation to one another. The development of radioactive isotopes has given us further insight into the role of various elements, including the highly important trace elements, in cellular activity, and into the localization of injury within the cell from biochemical action.

Notwithstanding all this, we are still only at the periphery of knowledge of living processes, and so far as the mind is concerned and its relationship to the rhythm of bodily processes we are almost as much in the dark as our predecessors of the time of Empedocles, Hippocrates, Plato, Aristotle, and others who nevertheless saw its importance. Let us not fall into the error, however, of thinking that because a thing is unknown it is unknowable, but remember that as the miracles of yesterday are the common practices of to-day, so the mysteries of to-day may be the commonplaces of to-morrow.

To attempt to unravel the relationships of body and mind in man is a formidable undertaking, but it must be undertaken, and if we could obtain insight into this relationship we should not only see the road towards the maintenance of health but also obtain light in matters which at present are quite obscure.

I have pleasure in acknowledging help in the preparation of this paper from Mr. Gilbert Watson, formerly of the Scottish Education Department; from Dr. Fidds of my own department; and from various publications, including Sigerist's *History of Medicine*, Guthrie's *History of Medicine*, Haggard's *Devils, Drugs, and Doctors*, Frazer's *Golden Bough*, various books in the Legacy series and of Professor Charles Singer.