Section of Balneology and Climatology.

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Airs, Waters and Places.

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It will not, I think, be disputed by those who are interested in Hydrology, in Balneology, in Climatology, and in allied branches of medicine, that two tendencies have lately become manifest at places where what is called spa treatment is carried out. The one is to explain (as it is said) the benefits accruing from treatment at any particular spa, in terms of ions, electrons, radio-activity and other fashionable fictions of the physico-chemists: the other, for particular spas, of malice aforethought, to abandon, submerge or lose their particularities, their individualities, and their character, in a competitive struggle for commercial success.

The prophets of Israel, no longer content with enjoining their clients to bathe seven times and be healed, now supply doubting Naamans with professedly rational explanations of the cure that is about to take place, and, no longer content with insisting that the waters of Jordan-les-Bains are really more efficacious than those of Abana and Pharpar, take pains to advertise the fact that their progressive municipality has recently installed sumptuous apartments where Abana douches, Pharpar wash-outs and Egyptian coloured lights may be administered in accordance with the directions of the priests of the House of Rimmon.

At any rate, both these tendencies—the tendency to afford "scientific" explanations of the inexplicable, and the tendency to set up artificial substitutes for what is only successful when natural—are the outcome of the notion that it is the mission of science to explain to us what happens in the outside world. Unfortunately, adherence to this doctrine leads many doctors to refuse belief in the occurrence of what they cannot at once explain in terms of current science—so that they are compelled, either to remain sceptical, or to invent some form of words that leads them to think that they *do* understand the workings of the natural world and can even imitate the processes of Nature in all their mystery.

Of course science never did and never will explain aught about anything in the way that once, when medical students, we thought it did. All science can do is to provide us with general statements that are convenient summaries of experience, that lead us on to make fresh observations, that so enlarge our experiences, and amplify our practical resources. At most, science "explains" by referring one set of phenomena to the generalization or law assumed in respect of some other sets of phenomena. But of the attempts to afford ultimate explanations, and of the assertions made concerning "modes of action," causation, and the like, by those who use these terms so glibly, the less said the better.

Now, in any text-book of medicine written towards the end of the last century, in those wonderful days when we thought Darwinism had taught us how man came to be, and that physics would shortly let us know all about the universe,—any text-book of medicine, I say, written when we thought that the stethoscope and the post-mortem room, with the aid of the microscope, would teach us all we need know about life and death and disease—spa treatment was only mentioned in terms of depreciation with hints about a "pervading atmosphere of quackery," and gentle gibes, like those of Sir Clifford Allbutt, about people who believed in the efficacy of the "water

chemicals." This sort of scepticism was natural enough to physicians who really did refuse belief in what they could not, as they said, "understand," and who, at the time of which I speak, deemed disease itself to be a kind of parasite that invaded particular organs, or later, pictured the world of disease as populated by armies of specific organisms going about seeking whom they might devour.

These views have so impressed themselves upon the profession that it will be a difficult struggle before what I may call the functional view-point is re-established, and we come to see that the greater number of diseased states, so far as they are of bacteriological origin, are reactions between the body of the host and organisms which normally are harmless (if not necessary), but which turn "bolshevik" and become mischievous when the functional integrity of the host weakens or is perverted. Be this as it may, however, it is a fact that since the time of which I speak, medical men, not content with observing the benefits accruing from spa treatment simply, naturally and conscientiously carried out, have seemed to derive some kind of satisfaction from alleging these benefits to arise from radio-activity and what not; as if such alleged explanations made the matter any more clear! Of course they do not. In the words of a well-known stage gag, they make it more difficult! We are indeed no nearer the ultimate understanding of the curative processes initiated at Bath or Harrogate than we were a hundred years ago, when crude chemical analyses were first put forward as explanations. Perhaps we are no nearer than we were 2,000 years ago when the Romans invoked tutelary deities! But the empirical observations are as true as ever! Even if we say that the sceptics who declare the whole effect of spa treatment to be "psychological" are right, what is gained? Are the results any the less valuable and desirable? Is the *modus operandi* any more clear? Suppose that at Bladudville (where, as Mr. Bernard Shaw has discovered, chronic inflammation of the nucal sac speedily disappears), we find that the waters contain distinct traces of lunar emanations in solution. Do we really understand better than before why and how people afflicted in their nucal sacs get better at Bladudville? All we have done, even when we find that lunar emanations in solution elsewhere, go hand-in-hand with apparent cures of nucal sac disease, is to establish a correlation and to shift the credit from the waters of Bladudville to solutions of lunar emanations. But why and how do these cure? It is the shift from the familiar to the unfamiliar that, in an American phrase, makes us "feel good," and that we have really found out something. In the meantime—if analogy counts for anything—we have probably lost a good deal more. Consider our experiences with quinine. A hundred years ago we had accumulated a vast store of experience concerning the cinchona bark, and its virtues were extolled, even in heart disease. Then came a time when chemistry foisted quinine upon us, and we laughed at those who thought bark was a cardiac tonic. We now give the once despised and rejected quinidine with amazing success not only in cases of heart disease, but in certain malarial fevers. Did we not then lose something when, in a moment of arrogance, we scrapped all that 200 years of clinical observation had taught us about "the bark"? And so, perhaps, is it in respect of our latest and supposedly most scientific "explanations" on physico-chemical lines concerning what happens at spas. There is the danger of diverting attention from sequences of experience, from clinical happenings of importance that should be observed and pondered, but which are dismissed, because the latest shibboleths offer "no explanation." As Mr. Bertrand Russell has somewhere said, and with profound truth, "there is nothing in the whole universe really less understood than why one billiard-ball rolls on when struck by another." And there is no quackery to-day more dangerous than the verbal quackery which, flourishing as luxuriantly in Harley Street as at any spa, allows us to pretend that we are nearer the ultimate understanding of life, death and disease than was Hippocrates: renders us content with the barren stone of false explanations instead of the bread of experience; and induces us to participate in an

attempt to standardize, to industrialize, to commercialize, Nature's own methods of cure, or rather to provide in the shopman's phrase: "Something which is quite as good"—but which is not!

Now the proposition that I would make is one that seems to me to embody a conception of which we are in danger of losing sight; and it is this: that the advantages derived from treatment or residence at any spa, in like manner to the physical and psychical consequences of birth and life in particular regions, are not fairly to be attributed to any isolated factor, but are a function of the *milieu*—in the sense of Auguste Comte. That is to say, they are a function of a totality of exterior circumstances necessary to provoke the characteristic reaction on the part of the individual.

As a matter of fact, the essential truth of this notion (which is, of course, in essence, synthetic rather than analytic) is implicit in two old and well-established aphorisms: the one that when at Rome we should do as the Romans; the other that when abroad we should drink the wine of the country. And I think that if we pay attention to this point of view we appreciate much that seems at first sight improbable, and we save ourselves much fruitless effort in straining after scientific rainbows. For, once relieved of the necessity of being incredulous as to the truth of what we do not understand, we waste no time in groping after explanations that explain nothing, and we find opened up before us a whole entrancing field of empirical observation that has been for long closed to those who are afraid of being labelled empiricists, if they observe without theory, and theorists if what they observe is inconsistent with dogma. We have been far too long under the tyranny of the laboratory theorists who declare that only in a laboratory can experience be gained. Experience in the field is every whit as truly "experimental" as is experience in the laboratory, and, for the physician and epidemiologist, more directly relevant. Yet such is the craze for analogical observation in the laboratory that even epidemiology—the science of disease amongst communities—is now being reduced to an affair of mouse traps.

Indeed, if we wish truly to progress, we must get back—and the sooner the better—to Hippocrates, whose empirical observations and whose few, yet grandly simple synthetic generalizations and inductions remain, and must ever remain, the foundation of all true medicine based upon the observation and study of Nature, of Nature's ways, and of Nature's remedies.

Nowhere in the Hippocratic Corpus is the quality that we love to ascribe to Hippocrates better manifested than in the immortal work which we know as *Airs, Waters and Places*, to which I would now make some allusion, first premising that a strong current of thought has lately set in, avowedly based upon the Hippocratic doctrines. To-day in France a new school is engaged in building up a new science of morphology which has little to do with the old, or formal morphology of the Victorian or Darwinian era, but which considers human form as the expression of human function; of functional reaction to *milieu*, or environment. This school, now led by MacAuliffe, Arone, and Thooris, derives inspiration from the teaching of Sigaud, Vincent, and Giovanni, and I would remind you that it was Sigaud who achieved the best definition of disease yet formulated; namely, that disease is dissociation of the functional unity of the organism. The object of this school is, then, the study of Living Man: of Man reacting to external influences, and revealing his individuality in his method of reaction; not only in anatomical form but in temperament—that is, functionally, psychically, and chemically, as well as physically.

This new science of morphology, then, seeks to observe man not as a static thing, disjunctive to surroundings, which compel him to life or death as he is or is not fit to survive, but as constituting, with his surroundings, one definite continuity that exhibits a perpetual flux of adjustment and readjustment.

And this is what the *Airs, Waters and Places*—that marvellously concise summary of accurate observation expressed in generalized form—teaches us to do, at the same time that it gives us in outline the general theories of epidemiology, of climatology, of hydrology and of functional anthropology so set out that there is but little to be added. And, moreover, these theories are theories of the right sort: synthetic statements of the kind which Poincaré says the fruit of right generalization should ever be—synthetic statements which indicate belief in the essential simplicity and unity of that nature which, as Bordeu, the French Hippocrates, declared, is yet so much more profound than is the most sublime mathematician or physicist.

Unfortunately, almost without exception, every English translator of Hippocrates has thought fit to employ a peculiar jargon that, however useful to the Greek student, fails to convey, to those who are not classical scholars, the force and directness of the original. The French translation of Littré is, however, beautiful in itself, and may perhaps account for the greater appreciation shown in France for the Hippocratic teachings.

"In the beginning," says the ancient writer, "whoever would wish to pursue properly the science of medicine must in the first place consider the characteristic effects produced by the seasons of the years, remembering that not only does each season in any year differ from the others, but that the same seasons differ in successive years. And then the airs and winds; such qualities as are common to all countries and such as pertain to particular localities. And then the properties and qualities of waters; for, as these differ in their physical characters, so do they differ in their action upon the body. So, too, must be considered the situation of towns, with regard to the prevailing winds, and to the rising sun. And the waters used by the inhabitants: whether marshy and soft, or hard, and from rocks, or salt, and unfit for cooking. And the habits of the inhabitants: their avocations, and whether they be eaters and drinkers to excess and indolent; or industrious, vigorous, frugal, and abstemious. From these things must he proceed to investigate certain others in particular, so that, when he come into a strange city he will understand the diseases there endemic, and the modifications of common maladies that there obtain."

Later, after some further detailed discussion of airs and waters, the writer passes on to the enunciation of what is perhaps the most famous, though the most frequently ignored, observation in epidemiology; namely, that in respect of not only epidemic but other maladies, the most important and dangerous seasons of the year are those of the two solstices, especially the æstival; and the two equinoxes, especially the autumnal. Belief in the accuracy of this observation implies no credulous acceptance of astrology, but recognizes an empirical fact, as also the associated induction that fluctuations in weather as well as of health tend to occur at those periods when there is variation and change in the relation of the heavenly bodies amongst themselves and to us. Even modern science has not gone so far as to dispute the relationship between the spring time and germination or between autumn and the fall of the leaf! Moreover, we are gradually recognizing as a matter of fact that, not only is there a seasonal correlation in respect of influenza, poliomyelitis and encephalitis, but that there are seasonal fluctuations and variations in the incidence and exacerbations of duodenal ulcer and pernicious anæmia—explain them as we may—to say nothing of other diseases!

However—and this is what particularly interests us here to-day—the Hippocratic writer not only recognizes the correlation between seasons and times, and those disorders of adjustment to the environment that we call being ill, but a definite correlation between climates, the physical peculiarities of places, and types of mankind. And in the passages in which this view is stated may be found the chief tenets of the school of observation to which I have alluded, as well as what is the rational foundation of that branch of medicine which makes use of airs, waters, and places for orthopædic and therapeutic purposes.

"For," says Hippocrates, "where the seasonal variations are most abrupt, there also is the country the most diversified, and the wildest. But, where the seasonal changes are the

least marked, there is the countryside the most uniform. And so, when we inquire, is it found to be the case, even with the inhabitants. For as some physical natures are like to the well-wooded and watered landscapes where they occur, so are others to the thin and poor soils; and others again to arid, parched and barren fields, and others to lush meadows and pasturages."

Of course this is not merely fanciful, as we may be inclined at first blush to think. It embodies an anthropological fact well known to simple observers, even if hidden from the learned. Every schoolboy knows Charles Kingsley's description of Martin the fensman, and Scott never lost an opportunity of instituting comparison between the rugged Highlander and the mountains of Caledonia, stern and wild. Now MacAuliffe and his colleagues have drawn attention to the fact that we can trace, cutting right across all other differentiæ, the occurrence throughout the whole of the animal kingdom of distinct types, so that we have rounded, or (chemically) hydrophilous types of men, horses, dogs, and even fishes, as well as (chemically) anhydrophilous or linear types of men, horses, dogs and fishes. Similar distinctions have been made in respect even of the vegetable kingdom, so that the influence of environment is nowhere better displayed than when, in the arid and dry countries we find men, beasts, birds, and plants of one type, and *vice versâ*.

For those who seek explanations of the usual kind, one may commend the work of Regnault, who, some years ago, definitely correlated the physical peculiarities of French peasants and agricultural labourers, in different regions, with the local peculiarities of the soil to which they are so much attached. Thus, in the quality of mineralization of the water, and so of the food, both vegetable and animal, in special districts, we are to see the explanation of the similar quality of mineralization, and so of physique, of the inhabitants. This question is intimately linked with that of the endocrine glands and their influence on physique, for we are becoming more and more recognisant of the fact that activity of the thyroid, for example, is linked up with iodine in the food and drink: that of the parathyroid with calcium and so on. We are only just beginning to nibble at this question, I say, but I venture to suggest that one of the advances of the future will be a recognition of the part played by minute traces of silicon, of fluorine, of arsenic, of copper and of other minerals in our food and drink, in their relation with the activities of particular glands and so in the production of physical and perhaps racial types, of one kind and another. At any rate, we are more and more driven to recognize that, as Regnault hinted, environment, while yet an *ensemble*, a unitary fact, is nevertheless of extreme complexity, its full appreciation involving perhaps a reconciliation of much that at present appears opposed in biological and anthropological thought. But these questions are no less complicated than are the epidemiological questions raised by the airs, waters and places, and it would seem that in both respects we are wiser men when, instead of spending time and energy in an endeavour to isolate this or that specific factor or to secure victory for this or that theory—Darwinism or Lamarckism, miasm or contagium, soil or seed—we seek to balance the results of modern and analytic methods by appeal to the older empiricism with its synthetic judgments and simplifying inductions.

It may be said, however, that Hippocrates does not, in the work to which I have alluded, make any express recommendations of a therapeutic order. True, but the therapeutic usage of airs, waters and places, so far as it is rational, is a direct outcome of the Hippocratic study of the influence of the *milieu* upon the health and character of the inhabitant. It certainly involves, I think, a greater recognition of the thought of Lamarck than it is usual to accord in this country: for, after all, when we send someone away to Bath, to Harrogate, or to the Pyrenees, for the benefit of their health, we are sending them away in order that they may be provoked by the new environment to respond, to adapt, to adjust, in a manner that we think desirable. That is to say, we do so if we are not ourselves misled, by our own jargon, to think

we are sending them away in order that some "specific" effect may be produced, by some specific form of electrical or lunar emanation. But if we hold to the Lamarckian philosophy and the Hippocratic tradition, we shall wonder whether the complexity of modern life and the luxuriant mechanisms of this age of gramophones, cocktails, wireless, evening papers and tinned foods, are not co-operating to destroy what we should earnestly wish to conserve—the local characteristic and individuality of these environments to which we resort. It seems to me that the local characters in respect of the airs, waters, foods, habits, and so forth, should be far more jealously guarded than they are. If we fail to remember, with Montesquieu and with Rousseau, that the peoples of this world are but as ant-swarms to whom the soil, the *milieu*, has given character, temperament, complexion, habits, form and function, and for whom climates and seasons, sounds and silence, colours, darkness and light, elements, aliments, movements and repose, have all contributed to produce the effects we observe as racial, temperamental, and personal characteristics, then we will find ourselves co-operating in the smoothing out of all those local characteristics, physical, dietetic, hydrological, balneological and the like, which have for centuries been recognized as beneficial, both in varieties of health and in varieties of disease. It is idle to attempt to enlist Nature in a partnership of which the *raison d'être* is the sophistication of Nature's methods. And I am not sure that even the spa physician himself is not more successful—in the right sense—when he, too, is a native and an inhabitant, with local colour and local tradition, rather than a fashionable and fugitive visitor during the high season.

At any rate, the more close is the link between the physicians and the locality, the more valuable will be their contributions to epidemiology and to our knowledge of the play between airs, waters and places and states of health and disease. We do more and more need observations of such nature as only the cultivated physician, attached to the soil and observant of Nature and Nature's methods can give us. Your President himself, with his important and valuable observations on the relation between rheumatism, temperaments, and the soil, has abundantly illustrated my meaning. Surely, if ever, the riddle of rheumatism will be solved by the co-ordination of such observations as those of Dr. Llewellyn with laboratory work, rather than by laboratory work alone.

The laboratory *by itself*, is bound to fail. But there is no reason why we should not prosecute investigations in the laboratory side by side with observation in the field of Nature: no reason perhaps but this, that, when we do prosecute observation in the field of Nature we are not quite so confident of attaining ultimate explanations as are our valued colleagues of the laboratory! And, even if we are driven, like Hippocrates and like Sydenham, to invoke "occult" and "hidden" forces, that will not mean that we are falling back into superstition and into darkness. It will, on the contrary, perhaps mean that we are adopting a more truly philosophic and scientific attitude than are those who make glib use of the verbal "explanations" that pass current to-day, and that obscure, rather than indicate for us, the operations of Nature and our reactions to that Nature around us, of which we form part.