

Observations on the casual and periodical influence of particular states of the atmosphere on human health and diseases, particularly insanity : with a table of reference to altitudes / by Thomas Forster.

Contributors

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Royal College of Surgeons of England

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OBSERVATIONS

ON THE

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CASUAL AND PERIODICAL

INFLUENCE

OF

PARTICULAR STATES OF THE ATMOSPHERE

ON

HUMAN HEALTH AND DISEASES,

PARTICULARLY

INSANITY.

WITH

A TABLE OF REFERENCE TO AUTHORS.

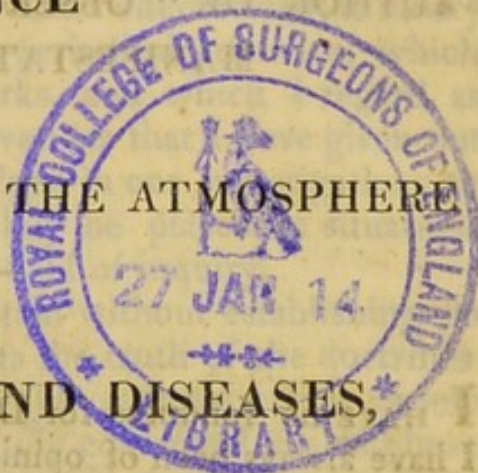
By THOMAS FORSTER, M. B. F. L. S.

Corresp. Memb. Acad. Nat. Sciences at Philadelphia, &c. &c. &c.

SECOND EDITION.

LONDON:

1819.



TO
F. G. SPURZHEIM, M.D.

AUTHOR OF "OBSERVATIONS ON THE DERANGED
MANIFESTATION OF THE MIND,"

&c. &c.

I HAVE no fondness for Dedications, as you well know; since I have always been of opinion with yourself, that the seeking for patronage, and the sheltering oneself under the authority either of renowned individuals, or of societies, were things very hurtful to the cause of Science. Nevertheless have I taken this plan in the present work, for the sake of acknowledging my debt to yourself for what I think the most useful part of these observations.

During our walks in the mountainous countries through which we travelled together, we had often opportunity of talking over the subjects of our inquiries. And I was much struck with the curious things you told me about the Periods observed by many diseases of the Brain, as well by those of what is called the automatic Life. I began from this time to remark the Periods of Diseases with new views. I had long noticed the effects of the atmosphere on the body; but I had not till now thought that this influence from without could be periodical. I began also to find other sorts of Periods, besides those which happen once in twenty-eight days, on which you made such curious remarks. I went on with these observations, and made them my chief employment ever since I left you at Capel Cürig, in August, 1815. I have taken various occasions to gather information from persons subject to fits of insanity, and of other periodical nervous complaints, respecting these afore-mentioned periods. And I have strengthened in my own mind, by numberless facts, the justness of your belief respecting the being of some periodical influence from without, on the functions of the Brain and Nerves. In none of the many Madhouses which I have seen, have I found many useful observations already made on the Periods

of the Diseases of the Mind. But these establishments, as you well know, are often so shamefully neglected, that no good systematic plan of observation has as yet been set on foot in them respecting the disease, for the care and cure whereof they were planned. Already are you too well aware of the truth of this remark, having brought into view, by your new Work on Insanity, the sorrowful state of those who are bound in fetters in the cells of these houses. I neglected, however, no opportunity which offered itself, to satisfy myself of the regular operation of this periodical influence, which you have since mentioned in your works, and which I regard as the only useful part of the hasty observations that I have given out here with the view that we may be helped in our investigations by the assistance of others, who may luckily be placed in situations which give them the range of a wider field of inquiry.

Although you have left Great Britain without establishing so fully in the minds of British Anatomists the truth of the doctrines respecting the Organs of the Brain, as the clearness of the proofs seemed to warrant, you have successfully contended against those who have opposed them. Your opponents have shown that their knowledge of Anatomy and Physiology was too inferior to your own, to assist them in the attack, and have resorted to ridicule and other means, which the weak have always had recourse to, in the absence of argument. But though it will be some time before the doctrine of the Organs of the Brain will be fully established among the multitude, yet the valuable observations on Insanity, and its periodical exacerbations, which you have given the world in your late work, will give rise to a better knowledge and treatment of that disease. Already have I foreseen that your book has called forth inquiry. And different practitioners have taken hints from various parts of that useful volume, and science and medicine will consequently be improved. I have paid particular attention to the Periodicity both of diseases in general, and of Insanity in particular, since some atmospherical phænomena which I have observed during the times of these Periods, made me think that we shall be able, by repeated observations, to unfold the cause of many periodical illnesses, so as to foreknow their coming, and guard against their effects.

Many of these opinions, like those of Dr. Gall and yourself, may be opposed and ridiculed by persons who have not been attentive enough to this part of the subject. But we must call to mind, that all new doctrines have been opposed at first, and Science has ever been slow and wavering in her march. Fair opposition, and real argument, are to be wished for, as they bring out the truth; but the attacks of those who, with the *ratiocinatio verbosa*, stigmatised

by Darwin as the unphilosophical jargon of ignorance and want of philosophy, exercise the *vis verborum* against whatever they cannot understand, must be left unnoticed and unanswered. A celebrated author says on a similar occasion,—*The Moon pursues her course unmindful of the dogs that bay at her* :—we must pursue our inquiries, and recollect, that—*Mit der Zeit kommt die Wahrheit an den Tag*.

Yours ever,

THE AUTHOR.

P. S. I may add, that even since the printing of these sheets, I have found passages in the works of many celebrated physicians relating to the monthly periods of diseases, which were discovered too late to be referred to in the Index of Reference at the end : we cannot, therefore, be accused of inventing a theory, by the publication of observations which must excite inquiry, and thereby verify or confute our opinions.

OBSERVATIONS, &c.

SECTION I.

The Human Health is influenced by Atmospheric Causes.

It has been a popular notion, time out of mind, that atmospheric changes have an influence on the state of human health. And such a belief appears to be founded on reason : for, since a number of persons, of various ages, of dissimilar constitutions and habits of life, and at different places, often become the subjects of disorder at the same time, so is it rational to attribute their malady to some general cause which then prevails. And the occurrence of disorder in particular kinds of weather, or at stated seasons of the year, which some persons experience, naturally suggests the idea that such cause resides in the air.

But it appears to me, that it is not the heat or cold, dampness or drought of the air, which is chiefly concerned in causing disorders, nor the sudden change from one to another of these states ; but that it is some inexplicable peculiarity in its electric state. The pain felt in limbs which have been formerly broken, previous to a change of weather, and the disturbed state of the stomachs of many persons before and during thunderstorms, are sufficient, I think, to warrant such a conjecture.

I have observed people with weak health complain of irritability and uneasy feelings, when, after fair weather, the wane-cloud

has first appeared, with other prognostics of rain; and they have felt relieved after the water has actually began to fall, and have said, "Now it is down I feel better." Other persons have expressed great uneasiness for some time previous to a great fall of snow, who are not ordinarily so affected before rain:—some summer showers of rain in large and electrified streams have the opposite effect, and produces pleasurable feelings.

During what has been called unhealthy weather, when medical practitioners have spoken of the general ill health of their patients, have I remarked circumstances which appeared to denote an irregular distribution of the atmospheric electricity. The manner of the distribution, and the continual and multiform changes of the curlcloud, branching about and outstretching its fibres in every direction; the sudden formation and subsidence of the sondercloud and wanecloud in different places, and the irregular appearance of the other modifications;—the intermitted action of De Luc's aërial electroscope; strong and varying winds; and the abundance of luminous meteors by night; are the circumstances to which I allude.¹

It cannot, however, be considered, that atmospheric peculiarities alone produce epidemic and other complaints: they must be regarded as having a compound origin, and as resulting from the operation of peculiar states of atmosphere on persons of particular states of constitution; otherwise, all persons would be affected, which is contrary to experience. There are, probably, innumerable varieties of temperament, of general habits of life, and of pre-existing diseases, which, in different subjects, vary the effects of the air. And many persons, perhaps, enjoy a state of health, and perfect animal action, which may be capable of resisting its evil influence altogether. It might be productive of useful results, if physicians of extensive practice would make accurate meteorological registers during the prevalence of any epidemic or contagious disorder; such as the influenza, which, a few years ago, took a range of some miles round London, and was also prevalent in certain other parts of the country.

But though we admit the influence of atmospheric peculiarities on the health, yet the manner and extent of their operation cannot easily be ascertained. They may deprive persons, already weak, of a portion of their electricity, and thus the energies of the brain and nervous system may be diminished: or the atmospheric electricity being unequally distributed in the air, or propagated

¹ For particulars relative to the forms of the clouds, see "Researches about Atmospheric Phenomena, illustrated by figures of the Clouds," &c. Baldwin and Co. London, 1815.—And *Phil. Mag.*

downward at intervals, it may occasion an irregular distribution of it in our bodies, and produce an irregularity of function. In whatever way the nervous functions may be disturbed, will a disordered action of the digestive organs be the probable consequence; and a state of nervous and digestive disorder being once induced, other diseases may ensue, to which there may be a constitutional predisposition.¹

It is not only the functions of the body which suffer from atmospheric peculiarities; the operations of the intellect, as they depend on the state of the brain, may suffer likewise from any cause which disturbs the animal system. In conformity to this notion, find we that the mind partakes of the irritability of the nervous system in general; and that in particular kinds of weather, which affect the functions of the body, persons find themselves incapable of the same clear and powerful exercise of the mental faculties as they enjoy at other times. It is well known that insane people are worse at particular times. The brain is the organ of animal life, as the other nerves are of that which is called automatic. It is a complicated assemblage of the organs of the different sentiments, propensities, and intellectual faculties; and any one of these may have a morbid action, in proportion as its particular organ be disordered. And further, the organs of the brain are subject to disease similar to other parts of the body;—to inflammation,—to morbid irritability,—to loss of tone,—to paralytic affections. They suffer, also, in common with other parts, from atmospheric causes. Hence the weather can affect the mind through the medium of the brain.

It would seem that there were a more immediate connexion between the peculiar state of the air, and the kind of disorders which might be thereby excited, than what consists in the general disturbance of the nervous system and digestive organs, and the diseases which follow by sympathy, in consequence of a predisposition thereto. For it may be observed, that even of those disorders which are not generally admitted to be contagious, one particular kind will prevail for a long time. Thus, in winter, the different symptoms of that state of body which we call a cold, appear, in some measure, to prevail and vary together; so that it is common to hear people talking of the fashionable complaint. Coughs, for a while, are the prevailing symptoms; sore throats are then the most common. It is in spring that certain kinds of cutaneous eruptions usually appear; and in autumn, that those ir-

¹ This part of the subject has been well illustrated by Mr. ABERNETHY, in his "*Surgical Observations on the Constitutional Origin and Treatment of Local Diseases.*"—London, 1809.—A work which every medical person ought to become acquainted with.

regularities in the functions of the digestive viscera, called cholera morbus, &c. happen, and which have been erroneously attributed to eating much fruit.

Catarrhal affections, commonly ascribed to the effect of cold, are said to be of two kinds: one, the mere consequence of checked perspiration; and the other, contagious. I believe both to be connected with atmospheric influence, though one may become infectious afterwards. The state of the digestive organs, and the previous habits of the patient, modify the complaint; but atmospheric peculiarities seem to have great share in exciting and varying the symptoms. Horses and dogs are affected with the contagious catarrh. But grass, carrots, and natural food, given to horses, and lowering medicine to dogs, often can cure many contagious complaints.

With respect to catching cold, I may observe, that either there must be some state of body previous to catarrh which renders it particularly susceptible of a check to perspiration, or some state of atmosphere which has a tendency to excite catarrhal affections; for persons frequently take cold when they take most care, and when they least suspect it. I have been exposed to repeated checks of perspiration, to cold, and to fatigue, and have slept exposed all night to wind and snow, during journeys in mountainous countries, without injury; but afterwards, when living higher, in cities, notwithstanding care, have I become the subject of catarrhal complaints.

It is possible there may be different states of atmosphere, which act as specific stimuli, and produce their corresponding peculiar diseased nervous actions, which are again still further varied by the particular state of constitution, and other circumstances of the patient.

Even contagious diseases break out at very uncertain periods, and often without any obvious cause, though they are afterwards evidently propagated by infection. Parts of Turkey are said to be visited by the plague every five or six years, while the same disorder appears more rarely in other places. The small pox rages for a time throughout whole tracts of country; at others there is scarcely a case to be met with: the same may be observed of scarlatina and measles. I cannot persuade myself that this is merely the effect of accidental introduction. Is it possible there may be some quality in the air, at particular times, whereby it is fitter for the conveyance of infectious matter? Or, can we suppose the effect of a peculiar state of atmosphere to be sometimes that of rendering the body more susceptible of infection than ordinary?

In artificial society are there so many causes operating to pro-

duce ill health, that the extent of the influence of any one can hardly be ascertained. Inactive habits of life, bad air, irritating food, gluttony, the drinking of spiritous and fermented liquors, the misguidance of the appetites, and the reciprocal operation of the mind and body on each other, have all a tendency to produce disease. But, though these various evil habits of artificial life are all detrimental, yet their kind of influence may be somewhat different: and, in proportion as families, and even nations, may have indulged, from time to time, in any of them, may they have acquired what are called constitutional peculiarities or temperaments; and the diseases dependent on them may be infinitely varied by the subsequent combination of different evil habits in individuals. For example, sedentary occupations have been considered to hurt our health, by causing an accumulation, or irregular direction, of the nervous energy which ought naturally to be spent on the various muscles. Thus patients, suffering great and peculiar nervous irritation, have been relieved by a degree of bodily exercise, which, in common cases, would have caused weariness. The different kinds of spiritous and fermented liquors are, probably, pernicious, by affording a stimulus exhausting to the strength: but whether they prove uniformly injurious in proportion to the quantity of pure spirit which they severally contain, or whether the different kinds of spiritous drinks cause different specific actions, is a point which, I think, has never been clearly determined.

Dr. Lambe considers animal food and impure water as exhausting stimuli; but he seems to think their respective actions on the system as somewhat different. If they do actually contain deleterious substances, their evil influence may be increased, in certain states of disease, by the lacteals losing their discriminating power, and, like common absorbents, drinking up unassimilated or noxious matter, in consequence of a disordered state of the chylipoietic system. In these cases, then, must attention to regimen be particularly necessary. Such a view of the subject as this, enables us, in some measure, to reconcile the beneficial effects of herb food on many persons, with the apparent health of others who live chiefly on flesh. Such a review likewise of the numerous causes of ill health, explains in part why the influence of the qualities of the atmosphere has been so much overlooked. To return from the digression into which I have unavoidably been led: those persons are most likely to be disordered by atmospheric peculiarities who have the greatest susceptibility of constitution, and at the same time the greatest weakness.

We do not know wherein consists the effect of the air of particular places on people; but, if health consist partly in the equa-

ble excitement of all the parts and organs of the body, and if particular airs excite particular organs, then do we see why a perpetual change of place may become beneficial to the health of some invalids.

Finally ; it was the opinion of many ancient writers, that, besides occasional pestilence, there was a local influence exerted on the human body, whereby, in particular parts of the world, certain diseases would always become prevalent ; and they usually ascribed this influence to the state of the atmosphere, in the particular place where the disease was endemical. Thus, Lucretius, who was certainly an accurate observer of nature, writes—

Nunc ratio quae sit morbis, aut vnde repente
Mortiferam possit cladem conflare coorta
Morbida vis hominum generi, pecudumque cateruis,
Expedit. Primum multarum semina rerum
Esse supra docui, quae sint vitalia nobis ;
Et contra quae sint morbo mortique, necesse est
Multa volare : ea quom casu sunt forte coorta
Et peturbarunt coelum, fit morbidus aër.
Atque ea vis omnis morborum, pestilitasque
Aut extrinsecus ut nubes nebulaeque superne
Per coelum veniunt, aut ipsa saepe coorta
De terra surgunt, vbi putrorem humida nacta est
Intempestivis pluviis, et solibus icta.¹

Again, in allusion to local influence—

Est Elephas morbus qui propter flumina Nili
Gignitur Aegypto in media, neque praeterea vsquam.
Atthide tentantur gressus oculique in Achaeis
Finibus : inde aliis alius locus est inimicus
Partibus ac membris ; varius concinnat id aër.²

Which Virgil has imitated—

Hic quondam morbo coeli miseranda coorta est
Tempestas, totoque Auctumni incanduit aestu.
Et genus omne neci pecudum dedit, omne ferarum,
Conripuitque lacus ; infecit pabula tabo.

SECTION II.

The Health of other Animals is affected by Atmospheric Causes.

ALL organised bodies, so far as human sagacity can penetrate, appear susceptible of diseased actions, which may be excited by dif-

¹ LUCRET. *de Rer. Nat.* lib. vi. 1089.

² LUCRET. *de Rer. Nat.* lib. vi. 1112.

³ VIRG. *Georg.* lib. iii. 478,

ferent causes. In man these causes are various and complicated, and the morbid actions which arise in consequence, are numerous and dissimilar. And this circumstance may be attributed to his organisation, and to his mode of life. The influence of the atmosphere, which is one cause, is apt to be overlooked in the human subject, from the variety of others which are continually operating; and which, though by their conjoint influence they predispose to, and often modify or aggravate its effects, have, nevertheless, a tendency to mislead our judgment as to the manner and extent of its operation.

Animals, particularly those which are domesticated, on which alone we can make any accurate observations, have many sources of disorder, though not so great a number as man has. They may suffer from hunger, from unnatural food, from fatigue, and from accidental injury, which can produce disease, and which may be the cause of their becoming affected by peculiarities in the air; notwithstanding their comparative freedom from the evils of intoxication, gluttony, and mental perturbation, that prove so frequently destructive to mankind.

The occurrence of what is called canine hydrophobia in distant parts of the country at the same time, must be ascribed partly to some peculiarity in the atmosphere; while the circumstance of its occurring at first only in a few dogs, would lead us to consider some preexisting, and perhaps unnoticed, state of disorder in the animal, as conducive to the more violent affection subsequently excited by the air, and capable of contagious propagation.

The effect of particular weather on animals was known to the Ancients—Virgil aptly alludes to the influence of unhealthy air on animals, though they were not subject to the general causes of human diseases, namely, wine, gluttony, and anxiety of mind.

———Atqui non Massica Bacchi
Munera, non illis epulae nocuere repostae,
Fronibus et victu pascuntur simplicis herbae
Pocula sunt fontes liquidi atque exercita cursu
Flumina, nec somnos abruptit cura salubres.¹

There are many other instances on record of epidemic distempers among animals, which have prevailed only for a time, and which seem to be referrible to the Atmosphere. A few years ago, in Essex, prevailed a mortality among cats, which carried off considerable numbers. And the well known history of the cats who died of *parotitis felina*, about Haywood, in Staffordshire, including the whole of a fine breed of Persian cats, is related by Dr. Darwin,

¹ Virg. Geor. lib. iii. 530.

in his *Zoonomia*. The same author relates a terrible contagion among the cats in Westphalia, of which, almost all who were affected, died. The mange is said to be contagious; but if this be the case, it is one of those disorders which, arising from unknown causes in a great many animals at once, may be afterwards propagated by infection. The same mode of reasoning seems applicable to the glanders of horses, and to many distempers of cattle.¹ Many symptoms of disease in animals are immediately traceable to the state of the atmosphere. Before rain, and particularly before great falls of snow in winter, we find dogs particularly dull: their ears become inflamed, and they lay drowsily before the fire all day, and can hardly be roused. Swine seem uneasy in windy weather, and show symptoms of restlessness even before the wind begins to blow, by running about and squeaking, with a peculiar tossing up of the head. Hence the popular notion, that pigs can foresee the wind. To state at length all the various modes by which animals show their sensibility to atmospheric changes, would fill a large volume; suffice it so say, finally, that some of the most accurate signs of the coming weather are made from the observance of animals. These prognostics are well known to the husbandmen of all countries. I have collected a great many in my work on *Atmospheric Phaenomena*, which are popular in our country, and these are collated with the remarks of the old Greek and Roman writers, in *Notes to the Diosemeia of Aratus*, printed in the *Classical Journal*, and in my edition of *Aratus*.

How far electricity may be concerned in this atmospherical influence, it is difficult at present to say: but the discoveries which philosophers are daily making, relative to the extensive operation of this fluid, (for such I must call it, till a better name be found,) seem to encourage a suspicion, that its agency may be concerned in producing every change in the atmosphere.

SECTION III.

Peculiarities of the Atmosphere affect the Life of Plants.

THE plants appear to be affected by peculiarities of the atmosphere, which do not consist in its degree of temperature or pressure. In the summer of 1810, almost all the planetrees, with the rough bark or rind, (*platanus occidentalis*,) became diseased in the

¹ For an immense catalogue of epidemic distempers among beasts, see the article *Epizootie* in the *Edinburgh Encyclopedia*, and the *Recueil de Mémoires sur l'Epizootie* lately published at Lyons.

neighbourhood of London, and for many miles round; very few of which, in comparison with the whole number decayed, recovered so far as to throw forth buds the ensuing spring, while the smooth-rinded planetrees, (*palatanus orientalis*,) and sycamore trees, (*acer pseudoplatanus*,) remained healthy. The same fact was noticed also in distant parts of the country, in Ireland, in Scotland, and even in countries still more remote from our own. The season was not either remarkably hot nor very unusually dry; but there were all those circumstances alluded to in a preceding section as denoting an unusual state of the atmospheric electricity.¹ The succeeding summer, that is, in 1811, some of the same species of planetrees were again diseased, and a few died. I am informed, that some years ago a similar, though not so extensive a mortality, prevailed among the smooth-rinded planetrees. From hence would it appear, that there were particular states of atmosphere which become specific stimuli to diseased actions of particular plants. Abundant proof of the fact, that certain seasons destroy particular tribes of plants, may be collected from various gardeners and nurserymen.

There are many other facts, which it would be useless to detail, that illustrate the proposition, that there are other peculiarities of atmosphere, besides heat, cold, damp, &c. which affect the functions, and destroy the life, of vegetables. This subject, however, appears to have been overlooked by Wildenow and others, who have written on the diseases of plants.

SECTION IV.

The Atmospherical Influence seems in many Cases to be Periodical.

WE call phaenomena periodical which appear to take place at regular intervals of time, in contradistinction to those which seem to happen at uncertain times. We might, however, find, if we possessed a more extensive knowledge of nature, that every natural phaenomenon had its particular period, and that there was a constant revolution of these periods. But we must confine this term, within our present limited views, to periods which revolve sufficiently often in the term of human life, to enable us to measure and compare the intervals between the occurrence of phaenomena. Even in this sense, can I assert, that the influence of the atmosphere on the health and illness of man, is in many cases

¹ The death of these trees has been said to be owing to the early rising of the sap, and the subsequent dry cold winds: but why was this species of tree alone injured, unless by some peculiarity in the air?

periodical. Previous to the more minute discussion of this question, may I observe, that different states of the atmosphere, exercising their peculiar influence, may have longer or shorter periods ; and the diseases caused at these periods may follow so rapidly on each other, and at such different intervals, arising from the divers terms of the periods, that we may overlook the regularity of their occurrence ; the different states, too, of the human body, by varying, or altogether resisting the influence of the period, may mislead us with respect to its existence.

With these forewarnings of the difficulty of the inquiry, shall I proceed to investigate particular periods of disease, after showing that their periodicity is conformable to the general appearance of nature.

SECTION V.

Nature exhibits herself in Periodical Phaenomena.

DOCTOR SPURZHEIM, of Vienna was the first person who, during the time we travelled together, called my attention to the periodicity of nature. I had long before noticed the influence of the various states of the air on the health ; but I was unaware that such conditions of the atmosphere had periods which revolved within the span of human life. He observed to me one period which excited a phaenomenon of very general operation,—that for one or two days, and at the interval of about twentyseven, most persons, without any ostensible cause, and without any particular complaint, felt themselves irritable, and in other respects indisposed for intellectual exertion. He noticed, too, a remark of Dr. Gall on various other phaenomena in diseases which occurred at this period:—that headaches, epilepsy, swoonings, and other nervous complaints often happened either monthly, or else once in about fourteen days.

He assured me of the real existence of these monthly periods, and that very irritable persons experienced a certain irritability at the half distance of time between two such periods. This remark roused my attention to the subject of periodicity in general. I observed that it was in this manner that the great Phaenomena of nature were wont to unfold themselves.

The round of the seasons was one striking example ; the revival of nature in spring, its maturation in summer, the fall of the leaf, and the general decay of autumn, and the winter's gloomy picture of suspended life, are monuments of periodicity. Time alone appears to me not to be the cause of the phaenomena of the seasons, but something which takes place at particular times. The place of

our globe with respect to the sun, the grand mover of the seasons, may also produce some other secondary agent in the atmosphere, wherein may reside the periodical power exerted over the surface of the earth.

On the change of seasons depend many other phaenomena. Atmospherical changes take place: plants grow, bloom, seed, and fade away. Different parts of the cerebral organisation of animals become active; and the instincts to pair, to nurse the progeny, to build nests, and to migrate, are roused into action. But the weather of the seasons varies as to time, and with it the times of the other phaenomena. These varieties of the seasons may have periods, though too distant asunder to be noticed by man. Every thing we deem unseasonable or casual, such as cold summers, wet springs, or warm winters, may happen again and again at periods wide apart in the lapse of ages. The word season is, in our language, distinguished from weather, to denote the periodical from the casual changes of the air. But all changes would probably appear periodical, could we contemplate them through ages past and to come. To every animal a certain span of existence in the world is allotted but in numerous individuals is this time shortened by casualties. So is it with all nature. All appears to us regularity disturbed by casualty. But all might appear regularity to a being capable of comprehending the whole moving in harmony.¹

I have alluded to the general Periodicity of nature. I shall now proceed to infer the Periodicity of the Influence of the Atmosphere on Health, from those cases wherein it takes place in Periods which fall within the limits of human observation.

SECTION VI.

The Periods of many Diseases are acknowledged.

THERE are many forms of disease, which, from frequently occurring from time to time with great similarity, become known and designated by particular names; as the contagious complaints, measles, fevers, &c. Although one should never confound symptoms with the diseased diathesis, or peculiar morbid state of the nervous system which may occasion them, yet the designation of any set of consecutive symptoms by one name, helps us in the communication of knowledge. In those forms called aguish, the quartan and tertian fevers, &c., there is a regular periodicity observed;

¹ One of the most obvious attributes of nature is the function of endless change; every moment there are new forms produced. And though some of these may be resuscitated periodically, yet they exist again with a difference of relation to others; consequently, the face of the whole of nature is

but in this case the one alternating state of the patient seems to be the offspring of the other. Consequently this is an example of periodicity as simply dependent on time, as any we know of:—that is to say, it is dependent merely on the time necessary for one state of disease to induce the other. Moreover, when the disease has once begun, seem these periods no longer to be caused by the external influence of the atmosphere. But still the disease itself, or that condition of body which is necessary to the symptoms, may have been first excited by the air on a constitution predisposed thereto by a concurrence of causes.

SECTION VII.

There is a Diurnal Periodicity.

THERE are many remarkable and well known cases of the exacerbation of disease returning at particular times of the day, or at stated hours of the night. Dr. Darwin has related several curious cases in his *Zoonomia*, in which the fits of some diseases have returned, for a long time together, at the same hour. In one case clocks were altered with a view to deceive the patient as to the real time, under an idea that the periodicity of his complaints was the effect of fancy: but it proved to be otherwise; for he awoke in the night, and looking at the clock, expressed his astonishment that his pulse should begin to beat irregularly an hour before the usual time.

In most diseases, may we notice a diurnal periodicity, besides the usual period or term of duration of the complaint. There are many kinds of headaches, for example, which happen at stated times of the day. I know a patient who, for upwards of twenty years past, has been sensible of some particular influence on his nervous system twice in the course of every revolution of the earth. He gets up in the morning apparently well, but a short time before noon begins to feel symptoms of headache, with feverishness and languor: the symptoms increase till about two o'clock, and then they subside by degrees, and are too slight to be perceived by five or six. When they are very bad, he has generally a return of the complaint towards midnight. In proportion to his general health, are these symptoms worse or better: but under no circumstances is he insensible to the time of day, by his feelings. He has experienced the complaint uniformly at those hours, both when toiling in business in London, and when travelling in the

changed by a difference in the combination of constituent parts. Now, unless there be no limits to the production of new forms, we may easily suppose regular laws of their periodical recurrence throughout ages.

country, in the habit of the healthy exercise of his body in the open air. He has not the organisation of mind, nor does he bear the character of a fanciful man, and I have frequently observed the effect of the complaint on him, at the time, producing a state of periodical languor and incapacity. I have neglected hitherto to observe whether or no those days in which he is worst, occur at the aforementioned periodical irritability; but I think this probable. He has seldom or ever any other complaint, lives temperately, and takes constant exercise. He is a philosophical man, and a great observer of nature. But he is so convinced of some diurnal influence, that he has often told me he felt it difficult to believe that people in general did not feel it.

We have reason, no doubt, to think that there are various original idiosyncrasies, or peculiar kinds of constitutions, wherein different stimuli act with peculiar effect; but still the exciting cause must exist, though its operation be not always the same. In the case alluded to above, there may be perhaps a particular sensibility to some diurnal influence, which does not generally operate with so much effect on the human constitution.

That there is a diurnal influence, can we learn from the observance of many vegetable phaenomena: it may perhaps be the same cause which acts on some human beings. Flowers in general open by the exposure to the sun; but others open and shut at particular hours of the day, even if the sun remain unclouded; as the purple Goatsbeard, (*tragopogon porrifolium*) and the meadow Geissbart, (*tragopogon pratense*), which shut up their flowers at noon.¹

The regular periods of some flowers, like those of diseases, are interrupted by the condition of the atmosphere. Even when the sun is shining at their usual time for opening, some keep their flowers shut, if rain be impending; hence they become prognostics of weather. This is said of the pimpernel.

There is a great analogy between the phaenomena of plants and those of animals and of man, resulting probably from an atmospheric influence exercised on both: and vegetable pathology serves to illustrate human. In the present instance, can we only compare a certain periodical influence on flowers, with its effects on a few peculiar constitutions. The abovedescribed flowers shut, and the aforementioned daily disease begins, at that very time, when, from the culmination of the sun, the least effect could be produced in a given time from his variation of altitude, namely, noon.

The effects, therefore, cannot be referred to the direct influence of his rays; but may depend on some concomitant diurnal changes

¹ What is called the Botanical Clock is a circular piece of ground planted with different herbs which open and shut their flowers at stated times of the day.

of atmosphere, liable to interruption from occasional disturbing forces.¹

The worst of these interesting investigations is the obscurity which overhangs them. The known instruments of meteorology do not demonstrate these periodical changes. We seem to be groping in the dark after their causes. We must however collect and accurately compare their effects; not omitting, at the same time, the observance of the daily variation of the magnetic needle, and of the atmospherical electrometer.

SECTION VIII.

The Atmospherical Influence is overlooked from its Obscure Manner of Operation on the Nervous System.

[ALL the phaenomena of the animal machine, the various functions of automatic life, of sensation, &c. depend ultimately on the nervous system. So do the diseases. No error is more common, or more dangerous to right practice, than that of confounding the various symptoms of disease with the morbid state of, or influence on, the nervous system, wherein the real disease consists. Even cancer, for instance, may be regarded as the consequence of a morbid diathesis. The various symptoms of head-ache, vertigo, cutaneous eruptions, and local diseases in general, mark a disordered state of the nervous system, and of the digestive organs. By curing the latter by medicines and diet, and the former by exercise, the symptoms frequently subside. And the exacerbations and Periods of them are often regular. The question is, How far is the influence of atmospherical causes periodical with respect to the peculiarities of the symptoms? I have noticed, and firmly believe, that there are Periods of general Irritability, and that at these periods those symptoms may be excited, to which, from other causes, the body be fore-inclined. But I cannot discover that those peculiarities of atmosphere, which seem to vary the symptoms, like the local influence noted in the second section, have any regular periods observable in the term of human life; we may regard it, therefore, as casual. Still, even in epidemical diseases of this sort, the daily and monthly Periodicity is not to be overlooked.

This peculiar influence on our bodies from without, acts in an

¹ With a view to know whether there be any circumstances common to plants which open their flowers at the same time, we should accurately compare their mode of generation, form, colors, and other attendant circumstances.

obscure manner: because, not consisting in the degree of heat, moistness, way of the wind, &c., we do not immediately feel its presence. The electrical state of the atmosphere seems more connected with the cause of the Periodicity than the coldness or drought. Registers of the different atmospherical electroscopes should be constantly made, and kept, with a view of ascertaining this point. By one which I kept have I found the unhealthy periods to be attended by a perpetual changing and unevenness in the action of the electricity of the air on the instrument which I employed to point it out.

Another observation of Dr. Gall, must be repeated here, while I am speaking of diseases, from its importance in practice, namely, that we must, in cases of disordered functions, always distinguish between the *Suppression*, as that arising from overloaded vessels, constipated bowels, external influence of the air on perspiration, &c. &c.—and the *Exhaustion*, such, for instance, as results from the constant use of stimulating liquors, violent evacuations, &c. Likewise is the state of *Fatigue*, in the most simple kind of disorder of functions, to be carefully distinguished from the two sources of disordered functions mentioned above.¹

SECTION IX.

The monthly Periods of Irritability have an Influence on the most important Functions of animal Being.

THE monthly and halfmonthly periods of irritability were first noticed in Germany. I doubted for a long time of their existence in reality; but observation afterwards convinced me of the truth of the observations. Dr. Gall observed, that once in twentyseven or eight days, was a period of irritability observed in most people. He found, by questioning many persons, that the cause operated very generally, that people at that time got up in the morning with uncomfortable feelings, but they knew no particular cause of them. These, in persons of very irritable habits, lasted several days; in others, only one: in some were they hardly perceivable. Some persons feel this twice in the month; others, I believe, oftener. Dr. Gall thinks he has noticed more quarrels, duels, suicides, and all those things which result from irritable feelings, or despondency, to be more frequent at that time. The influence alluded to, acts, according to him, with greater force at some times than at others,

¹ Philosophisch Medicinische Untersuchungen über Natur und Kunst im gesunden und kranken Zustand.—Von Gall, Wien 1791.

and often in particular places ; so that a great multiplicity of phaenomena, which result therefrom, are sometimes noticed in a particular tract of country. For example, a great number of suicides, during a short period, once occurred at Vienna, where that crime is in general very rare.

Persons afflicted with chronic melancholy are worse at this time. And in general at this period are the symptoms of mania more violent.

The aggravation of symptoms in madness, at particular periods of the moon, has long been believed, and hence the term lunacy. But the real periods do not correspond with any particular time of the moon. The term is therefore deceitful, and should be forgotten in pathology. There is, however, a periodical influence on insane persons at the times of the general periodicity ; and, in some cases, at other times. Ascribing it to the moon is one among the many remains of astrology, which may be a science originally founded on some observations of periodicity, misunderstood by future generations, and worked up by idealish fancy into a whimsical system of stellar influences. The ancients were accurate observers ; they knew, perhaps, of a monthly periodical influence on the body ; they knew, at the same time, that the moon was a monthly phaenomenon ; they noticed the accidental concurrence of certain periods of disease with celestial phaenomena ; and they contemplated with wonder the power of numerical calculus, as a source of knowledge of future events in the heavens. Hence they might be induced to infer one phaenomenon from another, from a too casual or hasty observance of their coincidence. The learned, too, particularly the priests, always laboured to keep the mass of the people in ignorance and superstition. If we contemplate their causes, and reflect also how prone we are to abuse the natural instincts of hope, and mystifyingness, then shall we not be surprised at the credulity of mankind. But we must never turn away, disgusted with superstition, from the investigation of truth ; nor absolutely deny that the periodical phaenomena may have causes beyond our globe and its atmosphere, merely because such a belief has been abused.

It appears that some practical results may be deduced from the knowledge of periodicity. Persons of irritable habits should, at this time, abstain from wine, irritating food, and from all moral causes of excitement ; and should spend their time in the open air, in exercise, and in cheerful society.

Dr. Gall has observed, that parturition, and female complaints, take place usually at the monthly period of irritability. Of this have I as yet not sufficient proof, to pronounce any opinion. He observes, too, that in particular years more males are born ; in

others, more females ; as if there were general causes for the determination of the sex, which had what I call casual, or, perhaps, alternative periods of prevalence.

It has often occurred to me—What causes old persons, decaying away with age, to die at last? If it were merely time, it seems that their death would be still more slowly performed. Some external cause seems to operate faster at the end. The natural close of mortal life is the last thing of all in nature, which ought to be regarded as painful. People fear it, from the absurd impressions made by weak instructors on their minds when young and susceptible, and which, like all infantine associations, have a tendency to come back to view with great force in old age. But though death is naturally slow, it would be almost infinitely protracted, if something did not put an end to the life at last. Finally, I believe that the life of persons lingering of age, or of many chronic diseases, is finished by some external influence during the periods of irritability.

These subjects are as yet obscure ; so is all science in its infancy. They are often confounded with absurd hypotheses ; so are all subjects of human observance and comparison, since all our faculties may be abused. Let us not be disheartened by any idle objections of this sort ; but let us rather try, by constantly observing and comparing phaenomena, to arrive slowly at the knowledge of their causes.

SECTION X.

Animals employ various Remedies against the Effects of Atmospheric Influences.

WHETHER by instinct, by the agency of particular organs in the brain, or by what cause, I do not pretend to know ; but animals have, in common with man, found out and adopted certain remedies against diseases, when they begin to feel themselves influenced by the state of the atmosphere. Dogs may be observed before rain to eat grass, particularly the *agrostis canina*, in order to relieve the stomach from uneasy feelings by vomiting. Cats have the same habit. Many other instances of this kind might be brought forward of the remedies employed by animals against the effects of atmospherical influence. Man, therefore, *a fortiori*, of his superior complication of intellectual powers, should be able to do this more perfectly. And he may, by comparing and reflecting on sensations apparently trifling, find out the cause of their

occurrence, and may be led thereby to the knowledge of causes still more powerful in their effects.

SECTION XI.

We can adopt Remedies against Atmospheric Complaints, particularly those which have Periods : hence the knowledge of them becomes useful.

THE history of atmospherical periods, and their influence on the body, merits the attention of Physicians in all countries. For, by a foreknowledge of these, we may not only prepare to mitigate the symptoms, but may be better enabled to judge at what stage of the disease the curative proceeding should be begun ; since we may err in the time of commencing those salutary methods of cure, which, in order to take most effect, should be instituted at a particular stage of some diseases. This is perhaps at present a very obscure part of medical knowledge : but since the publication of Spurzheim's works, particularly that on Insanity, have medical persons in this country become more attentive to the periodicity of diseases, particularly those of the brain.

It has been found that a disordered state of the digestive organs accompanies nervous diseases ; and I have before alluded to the excellent illustration of the connexion between the state of the health in general, and that of the chylopoietic organs in particular, published by Mr. Abernethy. But, as he observes, the disorder does not always begin in the digestive organs ; it commences sometimes in the nervous system. This I believe to be often, if not generally, the case with those diseases which have particular periods of their own, independent of the monthly periods of general irritability. What we called moral causes operating on the mind, atmospherical influence, and constitutional and hereditary disposition, produce disease at first in the brain, and the digestion and the secretion of bile are deranged by sympathy. With good air and exercise, and the excitement of pleasurable feelings if possible, from the action of the antagonist organs of the brain, must we combine remedies which act on the digestive organs, in cases of periodical and casual diseases of the brain. And there is no doubt but that to rectify the functions of digestion is of the greatest importance : but what I believe to be also essential, is, that we should time these curative methods.

It is true that hypochondriacal feelings, amounting almost to insanity, have been cured by 5 gr. *pil. hydrarg.* in the short space of one night ; but I suspect in this case the disease was on the decline, and the cure was hastened by the timely effects of the mer-

cury. I believe, however, that the functions of the liver may be apparently restored, and digestion may go on tolerably well in many diseases, and yet the nervous symptoms remain. I think, too, that diseases which seem doomed to run through a certain term, are often made worse by the untimely employment of the same remedies which, if given after the symptoms had passed the period of their greatest exacerbation, would have become highly useful in hastening the cure. This remark only applies to the disease when it has already gone on some time. I think it right to mention here, that I was unaware of this fact till it was suggested in my mind by some very recent observations on the brain. Formerly, observing the use of mercury in some cases, have I recommended it at an untimely stage of the disorder, and I have been surprised to find it did not take effect till after a certain periodical crisis, which the complaint passed. The first object of attention in all cases of nervous diseases, and indeed, of diseases in general, must be the state of the digestive functions, since experience has shewn that we cannot expect any amelioration of symptoms while the chylopoietic organs remain disordered. The medical treatment of insanity does not differ from that of other complaints in this respect, but generally involves the necessity of proceeding still further. For there will generally be found a great determination of blood towards the head, and a slow inflammatory action going on in the brain. Hence the necessity of carrying depletion further in this disease than in many others, wherein by rectifying the deranged functions of the abdominal viscera, we can immediately relieve symptoms in remote organs which may be only sympathetic. And the reason why insanity, particularly while it is periodical, is often left uncured after the digestive organs appear healthy, I take to be, as follows:—the determination of blood to the brain, either generally or partially not being counteracted, the symptoms of disordered action, the cerebral organs, not only remain, but by occasioning general disturbance of the system, have a tendency to disorder those of digestion again; and thus the disorders of the head and those of the abdomen go on feeding each other. The mode of treating insanity has been various among different practitioners, but it now seems admitted by those who have paid most attention to the subject, that the lowering plan becomes the most successful, and should be begun directly the periods of the incipient disease are discovered. By which means the crisis may be hastened in time, and mitigated in force.

Finally: diseases of the brain which may be brought on by accidental causes, as melancholy, which supervenes on continued or violent agitation and anxiety of mind; fevers, delirium, and other

complaints, evidently originating in violence done to the brain by moral and physical causes, acquire a certain periodicity, and have a natural term of duration; they are moreover influenced by the peculiarities of the atmosphere, and are exacerbated at the monthly periods. I differ, however, from Drs. Spurzheim and Gall in this, that I do not find the monthly periods to be perceived by all healthy people; nor are they, in my opinion, quite so regular as to the times of their occurrence. One experiment, however, deserves particular attention. Let any Lunation be divided into four weeks, so that each of the four points, called quarters of the moon, shall happen in the middle of each of the weeks; then I say those weeks which contain the new and full of the moon will be found the most unwholesome; in them the periodical irritability takes place; in them the crises of the greatest numbers happen, and in them nervous and unhealthy individuals feel worse than in the weeks which contain the first and last quadrature of the moon. Hence the monthly irritability may be said to happen within four days of the full and new moon.

Of the mode of this periodical action of the atmosphere, or of some other unknown cause, will I say nothing at present, since hypothetical opinions only bewilder the philosophical arrangement of facts at the beginning of inquiry.

SECTION XII.

Insanity has its Periods, and the Knowledge of these becomes Important to the Cure.

I HAVE already stated my opinion, that during the Periods of Irritability, Insanity, particularly the melancholic kind, has often its exacerbations. The knowledge of these periods is therefore of the greatest importance, since the curative proceeding may often be begun with most effect just after the period be passed. In some cases the patient can be prepared against it by bleeding and medicine. At all events, it should be known, if possible, beforehand. The periods of irritability do not happen precisely on the same day to all persons. In twentyeight days are there two periods; and Gall has classed patients according as they are affected at one or the other, particularly females. Some persons are affected at both the periods. A few observations on any particular patient, will enable us to discover the periods and manner of being affected, which belong to his particular constitution. Besides the above-mentioned, are two other periodicities to be noticed in Insanity :

one is a diurnal period ; some mad patients being worse at noon, in the morning, at night, &c. &c. Another, may be called the long period or span of the disease. For, though mad persons have maniacal exacerbations of the disease at the daily and monthly periods, and sometimes at the time of the casual atmospheric influence, yet is there a certain term, or course, which Insanity, like other diseases, often runs through, and which should be accurately studied. I shall call this long period the Term of the Attack of Mania. It is of longer or shorter duration in different cases : in some, is it continuous through many monthly periods of exacerbation. Towards the end of the term, happens it frequently that the delusive ideas are only felt during the few days of the monthly period ; or are at that time recollected only in dreams.¹ Finally, the terms of Insanity are liable to return at very distant periods of time, sometimes annually.

The circumstance of dreams leads me to notice a phaenomenon, which has been mentioned to me, by melancholic patients, who have recovered of several terms of hypochondriasis.—When the disease first began, they became sensible of a peculiar fixed sentiment of fear and anxiety, which they could readily distinguish from the most violent effect of grief and fear from common external moral causes, and they knew it to be morbid. At periods, as the disease advanced, did they regard the hallucinations as real objects of terror ; but as the term of the disease came towards an end, they lost this belief, and became conscious again of the diseased state of the feelings even at the periods of exacerbation : the disease at length subsided ; but the patients at the time of the periodical irritability had hypochondriacal dreams, attended with peculiar fears, and they awoke rejoiced to find the hypochondriasis was really gone, and had only then been dreamt of. It will be found, that persons with the brain greatly developed under the middle of the parietal bone, are most liable to this kind of insanity.

Finally, as insanity is a diseased action of the organs of the brain, so must it be modified according to their comparative magnitude. I do not describe various symptoms here, as Dr. Spurzheim has treated of this disease at length, in his recent work. But the periods of Insanity (of the real existence of which, actual observation has convinced me,) are of so much importance in the cure, that I shall be excused for this imperfect attempt to call them into more general notice.

¹ Some writers think that the periodical state of Insanity may end in a continuous state, and then be sometimes cured. I refer the reader to an excellent paper on Insanity, recently published, by Dr. Thomas Mayo.

SECTION XIII.

Certain Suicides are Periodical, and may be Prevented.

SELF-MURDER has ever been regarded as a crime ; and it is right that it should be viewed in that light, when committed by persons in a sound state of mind, who, from want of fortitude to withstand the pressure of evil, put a voluntary end to their life. But suicide is frequently the consequence of a disordered state of the brain, and is committed by persons who have no external cause of uneasiness. In this case does it often happen during the periods of irritability before mentioned ; and it must then be regarded as the effect of Insanity. By medicines, and particular moral treatment of persons who have this tendency, exhibited to them about the time of these periods, might the intentions of many often be diverted. Dr. Spurzheim has written some useful remarks on this subject in his late book on Insanity, which all who have the care of unfortunate persons of this description should read.

In order to ascertain where suicide results from a disordered state of the brain, must we examine various circumstances under which it may have occurred, together with the natural character of the individual. Persons who have much natural Timidity, with Ideality and a romantic disposition, and also Destructiveness, are more liable to this disease than others in whom these feelings are weaker. As in madness of the more determined kind, so also in suicide from insane feelings, must we examine not only the disordered state of the brain and nerves, but also their kind of organisation, since on the latter depends the varieties of the symptoms. I shall illustrate these opinions by a few cases, and shall select those which have not been published before in the recent works on Insanity.

A patient complained for a long time of lowness of spirits and fear, but could assign no object of his terrors. He reasoned with himself for a long time against this feeling, but at length gave way to it, became melancholy, and put an end to his life by hanging. This is a simple case of the morbid activity of a particular organisation, without an external cause even imagined.

Another person got into a low state of health from disorder of the digestive organs, attended with want of bile, which at length affected the brain : he had periods of exacerbation, during one of which he declared he should be ruined by bills which were coming in, though all his comrades knew he owed very little. He walked quietly up stairs in one of these fits, and hung himself. Such per-

sons, had the periods been foreknown, might have been prevented from doing the act.

The choice of a peculiar mode of death, which some persons have, shows also the physical nature of the propensity, since we must ascribe it to the peculiar and modified activity of a disordered brain.—Of the following case have I been assured, on good authority.

A child was in the habit of playing in a garden, from whence it frequently ran into the house, and said, a voice always called it to the water, but it dared not to go. It repeated this story frequently, saying, the voice always called it; it must, and would go. The child was one day found drowned in the same water.

There are persons, who feel a great propensity to end their existence by water, fire, &c., and even by means more whimsical, and who reason against what they at first call such nonsensical feelings, but who at length contrive their death by such means. Some of these persons know themselves sufficiently, never to trust themselves in particular situations, at the periods when they are irritable.¹

I know a person who refused to ascend with me a dangerous precipice, saying, that at that period he could not trust himself, on account of a propensity, which he had had from his boyhood, to throw himself down from high places. He would have willingly gone in a few days' time without fear. Several persons have spoken of this mad propensity to throw themselves down from heights, but who retain sufficient command of themselves never to do it. It is probable that in many suicides, from moral causes, in which the individuals have chosen this dreadful mode of death, they have been directed by some internal propensity; since some have taken trouble to kill themselves in this particular manner, when easier methods offered themselves.—Others have felt, at times, an almost resistless inclination to throw themselves into great waterfalls, for which they could not account; as no other sort of death seemed pleasant to them. I could relate numerous other cases of persons who have confidently assured me, that at periods of irritability they have felt the most violent desire to die by particular means. I forego the narration of them, because they seem almost incredible, and the relation of them could do no good to the illustration of physiology. I notice them merely to excite the attention of those who, from their professional situations, have more extensive opportunities of observing and conversing with

¹ Foeminarum catamenia etiam occurrunt in hisce temporibus quæ Gall periodica dixit. Tum, insanis accedunt symptomata violentiora, atque nonnunquam Suicidium.

the insane. In Germany many cases of this kind have been commemorated. Indeed, in nations where ideality prevails must the fanciful character of the feelings be more developed, and those infinite shades and modifications of sentimentality and error of mind be observed, which, when persons of this kind go mad, must give a peculiar character to their symptoms. Very curious cases are on record; but it is of less importance to enumerate the particulars of these, than it is to excite the attention of medical men to the degree in which the disorders themselves may be periodical.¹

SECTION XIV.

ALTHOUGH I have determined not to enter into any hypothetical explanation of the manner in which the periodical influence on the brain and nervous system be exerted; nevertheless, there are several considerations respecting the structure and functions of these organs, which should be examined and kept collaterally in view, as they may lead to the discovery of many curious phaenomena at present unknown. One principal circumstance to which I allude, is the duplicity of parts throughout the whole nervous system. The Organs of the Brain are double, there being two corresponding hemispheres; at the same time that consciousness is single. Hence arises a question,—Whether the two hemispheres act contemporaneously, or alternately? There are facts which seem to favor the notion, that both act together; while other facts would incline us to believe their action to be single and alternative: among the latter may be mentioned several circumstances which attend periodical irritability.

I shall omit the modes of reasoning adopted by former writers, and shall proceed to discuss this question on the strength of experiment alone. I must, however, observe previously, that some persons have tried to explain this phaenomenon by the uniting of the parts in the commissures of the brain; others by the Organ of Individuality, which is placed as it were in the midst of the Organs of the Intellectual Faculties in the forehead.² These notions appear

¹ Since the publication of Mr. Abernethy's Works, and the consequent improvement of medical practice, several persons have positively asserted that nervous diseases never occur while the digestive organs can be kept in order. This I believe to be generally true; but it is true also, that during the periods of irritability it is often impossible, by medicines, to regulate the stomach and bowels. Hence, at these times, we fail in the most essential means of cure.

² Recent observations have induced Dr. Spurzheim to separate this part of the Brain into two Organs, 1stly Individuality, and 2dly Phaenomenality. He has likewise recently admitted the existence of the Organ of Mystifying for which I so long have contended.

to me, however, to be vague and inconclusive. Whether the two sides of the brain act separately, or whether they act together; whether the commissures unite the action, or whether there be some as yet unknown arrangement of the cerebral fibres, whereby these are connected with the Organ of Individuality placed in the middle, I do not pretend to know; but granting either case, it is plain the mystery of animal life remains unexplained. Those who would account for life and mind by the structure of the Organs of the Brain, are just as absurd as the philosophers who thought they had explained vision by showing that the eye was a magick lantern, forgetting that if it were the completest Camera possible, there must be yet another percipient eye behind to see it! Just so is it with the brain. None of the cerebral arrangements can explain perception, which we may therefore continue to regard as a property of a Being essentially distinct from its Organs, however necessary these may be to its various manifestations in the world. The consciousness of our own individual Being is quite different from the belief of the individual existence of external objects. It is a simple idea, and like time and space, cannot be defined.¹ Rejecting then, the illfounded and fallacious arguments of materialists, used to disprove the existence of the mind, shall I proceed to state some curious phaenomena connected with the functions of the brain, which tend to establish the alternating activeness of the twofold parts.

During the periods of irritability, which happen either once or twice at equal intervals in the course of twentyeight days, may be constantly remarked in the brain an indisposition for intellectual exertion, and a more irritable state of the feelings than usual. Might not this be the case were this period the time when the active state of either hemisphere was changed? Might not the general irritableness of the body be the result or concomitant of this change of activity from one side to the other? There are persons, who, being of very irritable habits, are conscious every time of these periods, and who find themselves more strong in intellectual power at one interval between two periods, than they do at another. Moreover, the interval of greater power is alternate with that in which the faculties of the mind are

¹ I introduce this observation merely to confute some common prejudices that have gone abroad, respecting the tendency of the doctrine of Gall to materialism. The doctrine is merely founded on an arrangement of facts, and respects the connexion found to exist between the particular character of the mind, and the particular forms of the brain, and aspires not to any metaphysical knowledge of the first moving principle.

weaker.—May not this arise from the relative strength of the two hemispheres? The right side, for example, may be the strongest. Both hemispheres may be at all times in a state to act, when necessity requires, but one may be in a particularly active state, and may be used on all common occasions. The same observation may apply to the five external senses, and to the cerebellum, since all the parts are double.

I have observed another very curious phaenomenon with respect to the Organ of Vision. At monthly periods irritable patients have sometimes the following particular attack of disorder of the system in general, and of the front parts of the brain in particular. Soon after breakfast, or some other meal, they find suddenly their vision obscured, objects are in part unseen, and there seems a wavy motion in every thing: sometimes one eye is affected before the other; but whether this be the case or not, by shutting one of the eyes, can the patient generally see more distinctly with the other alone than he can with both open together. This partial blindness lasts less than an hour, and is succeeded by a headach in the frontal parts, accompanied by fever, nausea, and disturbed functions of the digestive organs, after which the whole goes off. Persons have mitigated the attack by medicines, but they can not always keep it away. It has been attributed to indigestion; but though it may begin with indigested food, yet something peculiar must have previously disqualified the stomach for digesting, and the disease is generally periodical.¹ The Organs of Vision constitute a very particular apparatus, and have great connexion with the brain. The supposed decussation of the optical nerves is close to the brain. When the frontal parts of the brain have been called into too much action about the time of these periods, then are the abovementioned symptoms more violent. In some persons does this, like other diseases, wear out by degrees. There is always a dulness of thoughts and feelings before, and a hurried action of the brain after, these attacks.—Cannot this be an attendant on a too sudden change of the active state of the two hemispheres? That one eye is used in a manner somewhat different from the other, may be inferred from the well known experiment of putting the finger into a ring with one eye shut. Do these functions alternate?

The Periods of Irritability are of longer or shorter duration, according to circumstances; sometimes they last three days, generally two, and always one. A very irritable state of the nervous system, which may have lasted a long while, is sometimes ended

¹ This disease is described by Dr. Parry in his *Outlines of Pathology*, and is there referred to the state of the stomach as an exciting cause.

at one of these periods, by a violent attack of the above kind ; or, in other patients, by epilepsy, or by other nervous complaints, to which they may be predisposed. May not one hemisphere be in a more irritable state than the other ; so that the patient be relieved, when, after the effort made at the period of change, the action devolves on the opposite side ?

I do not mean to infer that the effect of the Period is merely the change in the activeness of hemispheres ; but this may be one phaenomenon, among a great many others, which take place at these Periods of general Irritability.

There are yet other facts, which incline me to believe in the alternative action of the double parts. Persons who are only half mad, or who have particular, maniacal hallucinations, have said that they feel the insane idea on one side, and have, at the same time, judged of its untrueness with the other. In many of these persons the sound state of mind is alternate with that in which the erroneous ideas are believed by the patient, and mistaken for reality. I could advert to too many cases of this kind, to doubt of there being some particular cause for the opinion on the part of the patients, that they can think with one hemisphere alone. Dr. Gall has mentioned instances, even among his friends, of persons who assert that they can only think well with one side. One hemisphere has been found to be bigger than the other in some of these cases. That one side can act alone, have we often had proof ; for one side has been destroyed by accidents, or by disease, while the other has continued to perform its functions.*

The observations which I have advanced above, respecting the change of action in the brain, have rather been put down to excite future inquiry, than for any other reason. This subject is involved in deep obscurity.

With the same view, have I endeavoured, in the hasty composition of these sheets, to illustrate my opinion respecting the external influence of the air, and its periods, by a very few cases selected for that purpose, while I have before me numerous others of a similar kind, on which these opinions have been founded, the detail whereof would be irksome to the reader. I have left out, for the aforementioned reasons, any hypothetical opinions about the cause and manner of operation of this atmospherical influence.

* Some persons have supposed that we only use in common, one eye at a time, and that when we hold our finger up before a candle, and either see two candles and one finger, or two fingers and one candle, we see the candle with one eye and the finger with two, or *vice versa*. If this be true of the eyes, why not also of the Organs of the Brain ; since all the parts agree in this common circumstance of duplicity.

It is right to mention, lastly, that the knowledge of some periodicity in diseases has been long known, though all writers, before the time of Gall, have overlooked the very general operation of the monthly periods. Dr. Darwin stated his opinion, that the cause was to be ascribed to solar and lunar influence; and instanced the exacerbation of fevers, and other symptoms of illness, about six o'clock in the evening, the periodic cough, &c. &c., in proof of his opinion. He thought likewise, that the diseases which begin with torpor, and end in pain, as headach, &c. often begin about six hours after noon, or midnight.¹

The same author has also noticed the occurrence of the catamenia at lunar periods. He likewise remarks the effect of the moon on hydrophobia, and on diseases of other animals, which I do not repeat, as they are already in print.

Without entering into his train of reasoning on this subject, I may observe, that the moon is particularly connected with the changes of the atmosphere, as well as with those of the tides; hence she may have a share in producing other aërial causes which influence terrestrial bodies. In consequence of observing these circumstances, have accurate meteorologists, of late, divided their weather-journals into lunar periods; and they have already found the mean state of barometrical pressure usually to attend the first and last quarters, while its extremes more often accompany the new and full of the moon.²

But the monthly Periods of Irritability do not correspond exactly with the lunar periods, consequently there is a precession and retrocession of them, with respect to the moon's place in the heavens. Nevertheless they do not seem to precede, or to retrocede, more than three days and a half from the new and full moon. A sufficient number of observations, however, have not as yet been made, to determine the exact relation between the moon and this phaenomenon, which, with many other at present hidden and mysterious laws of Nature, the repeated observations of philosophers may unfold in time to come. In order to acquire a knowledge of this relation, we must pay particular attention to the electric state of the air, by making daily observations on the atmospherical electrometers, electrical kites, &c. I have constantly found a very great irregularity in the indications of these instruments during the time of epidemic complaints, and at the monthly Periods of Irritability.

¹ See *Zoonomia*, Class IV. ii. 4. and Section xxxii. vi. and xxxvi. iii. 9. where the author has related the monthly and daily period of erysepelas, haemorrhoids, gout, headach, fevers, and many other complaints.

² Consult Howard's "Climate of London."

APPENDIX.

THE remarks of the foregoing pages are not altogether new, although they have not been much heeded by modern practitioners. Many treatises, both on the influence of the atmosphere, in cases of epidemic complaints, as well as on the periodical returns of symptoms, have been written and have fallen into oblivion. But I did not quote these in my pamphlet, since the most part of the above observations were made before I became acquainted with works on similar subjects, and at a time when I had no opportunity of recurrence to libraries. I have lately, by ransacking old collections of medical books, become acquainted with many treatises relating to the subject of these sheets unknown to me before; and of which I shall add some short account for the use of those readers who may wish, in following up this curious object of medical research, to be the better prepared for making future observations, by an acquaintance with those of persons who have gone before. Thus can one trace the knowledge of the casual and periodical influence of the atmosphere on the human body, from the earliest remarks of the Greek and Arabian physicians, gathered from, or improved by, their acquaintance with the wisdom of the East, down to that important time when Dr. Gall first made the remark that there was a monthly general influence, which he called the Period of Irritability—a time which forms an important epoch in the history of anatomy and physiology, from the unfolding of facts about the structure and functions of the organs of the brain, whereon the true natural history of the human race must at length be founded.

Hippocrates, Areteus, and Galen, noticed the existence of some influence from without in epidemical diseases; and knew of some local influence in endemics, which the Roman physicians and philosophers confirmed, and which were alluded to by Lucretius and Virgil in passages already cited. After these, when literature and knowledge came to life again after the middle ages, appeared many treatises on periodicity and external influence, which I have sorted in the index according to the branches of the subject.

When it is considered, that not only the periods of diseases, but even the influence of the sun and moon in their production, were credited and written on by such persons as Hoffman, Sydenham, Meade, Darwin, and other physicans of celebrity, then should I

be excused if I extend this subject a little farther; and should be exculpated from the charge of a fanciful theorist, even by those (and they form a numerous class in all countries,) who would rather rest their knowledge on authority, than be at the trouble to gain it by observation.

Index to Writers on Endemical Diseases, (hence called Folksillnesses, Volkskrankheiten, &c. &c.)

Hoffman, *Dissertatio de Morbis certis Regionibus et Populis Propriis*.—Hal. 1705, und op. vi.

Meyer, *De Morbis Endemiis*, 1737.

Tully, *Essai sur les Maladies de Dunkerque*.—Dunkirk, 1760—12.

Wintringham, *Treatise of Endemic Diseases, &c.*—Eborac. 1718, and Works, I. n. i.

Galenus, *Fragment. ex Aph.* p. 34.

Index to Authors who have written on Diseases which happen in the several Seasons of the Year.

Alberti, *Dissert. de Morbis Aestivis*.—Hal. 1745.

Wilson, *Short Remarks upon Autumnal Disorders*.—London, 1765.

On Diseases which happen apparently from Casual Peculiarities of the Atmosphere, called Epidemical Distempers.

Baeck, *Tal om Farsoter, &c.*—Stockholm, 1765—Comm. Lips. Suppl. Dec. II. p. 69. Vogel, *N. Med. Bibl.* vi. B. p. 189.

Berger, *Diss. de Aëris Potentiâ in Epidemicorum Morborum Generatione*.—Hal. 1727.

Borellus, *Observat.* Cent. iv. n. 42.

Caranta, *De Natura Auri*, pp. 29, 30, (*in nauibus cum ingenti numero murium.*)

Commerc. Lit. Nor. 1782, p. 204. (*Uffenheimensis.*)

De Darguiville, *Morb. Epidem.*—Anni 1693, &c.—*Emetic, et Phlebot. Laudes*.—Paris, 1693.

Ephem. Nat. Cur. Dec. II. Ann. v. Obs. 169.

viii. — 114.

ix. App. p. 15.

x. — 79.

Dec. III. — i. Obs. 71.

ii. App. p. 45.

iii. — 137.

iv. — 115.

121. 127.

v. & vi. — 153.

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| | viii. | — | 1. |
| Cent. I. | App. p. | | 1. |
| | III. | — | 22. |
| | VI. | — | 1. |
| | X. | — | 531. |
- Forster, *Researches about Atmos. Phaen.* 2d Edit.—London, 1815. p. 165.
- Farina, *Ortus et Occasus Morb. Epidem.*—Romæ, 1672—12.
- Fischer, *Diss. de Morbis Epidem.*—Erf. 1727.
- Forwättning, *Of Provincial Doctorernas Berättelser.*—Stockholm, 1765.
- De Gorter, *Morbi Epidemii Brevis Descriptio et Curatio per Diaphoras.*—In Harderov. 1733.
- De Hahn, *Epidemia Verna quae Uratislavium.*—Anno 1737, afflixit, 1737.
- ΠΠΟΚΡΑΤΗ, lib. vii. *Epidem.*
- Huswedel, *Bericht, wie bey einfallender Krankheit, jeder sich verhalten solle.*—Hamburg, 1663.
- Koker, *Diss. de Morbo Epidemico, Anni 1719.*—Lugd. 1720.
- Kruger, *Beschreibung der einheimischen Krankheiten wie dieselben durch himmlische Influenz aus der Lust die Menschen, anno 1692 inficirt.* Braunchw. 1692—4.
- Lepecq, *de la Cloture, Journal de Med.* T. xlvii. p. 387. 483.—T. lvi. p. 193. (Normandiae).
- , *Anleitung Epidemische Krankheiten zu Beobachten.*—Leipzigk, 1785. A. D. B. lxviii. p. 105.
- Löscher, *Diss. de Phenom. Septentrionale Luminoso nec non Morbo Epidemico, Anni Currentis.*—Witeb. 1721.
- Ludollf, *Diss. Gen. Febr. Epidem. Concep.*—Erf. 1753.
- Ludwig, *Advers.* I. ii. 1.
- Menzer, *de Morb. Epidem. Antiquis.*—Basil, 1740.
- Mertens, *Practische Bermerkungen über Verschiedene Volaskrankheiten.* 1785.
- Nun, *de Spieciebus Morb. Epidem. &c. &c.*—Erf. 1758.
- Pohlius, *de Morb. Epidem. ab aëre Atmos.*—Lips. 1749.
- Recueul, *de Memoires sur l'Epizootie Lyons.*
- Sauval, *An Morbi omnes, omnibus fiant temporibus.*—Paris, 1706.
- Schenck, *Ols.* vi. 103.
- Sydenham, *Op.* p. 42. 129. 137. et passim.
- Vaber, *Morb. Epidem.*—Viteb. 1717.
- Wintringham, *Works*, I. n. 1.

Writers on Periodical Diseases in general.

Act. Nat. Cur. Vol. vi. obs. 6.

- Alberti, *Diss. de Palendromia Morborum*.—Hal. 1750.
 Büchner, *Diss. de Primis Viis Morborum Periodicorum sede frequentissimâ*.—Hal. 1768.—Bald. Auszüge. I. 81.
 ———, *De Morb. Periodicis, (in general)*.—Hal. 1754.
 Darwin, *Zoon.* Sect. xxxii. 6.—xxxvi, ii. 3. &c.
 Ephem. Nat. Cur. I. iv. and v.—II. iii. 40.
 Franck, *De Period. Affect.*—Pavia, 1791.
 Marescot, *Period. in Morbis, &c. &c.*—Paris, 1575.
 Medicus, (Fr. Cas.) *Geschichte Period. Krankh.*—Carlsruh, 1764.
 De Neufville, *Diss. indol. Morb. Period. Hypochon.*—Göttingen, 1785.
 Plouquet, *De Morbis Periodics.*—Tubing. 1783.
 Du Port, *Ergo περιόδων Causa, &c.*—Paris, 1623.
 Riedlin, *Lin. Med.* 1695.
 Spichenbergen, *De Morb. Period.*—Leyden.
 Stahl, *De Affectibus Periodicis.*—Hal. 1702.
 Testa, *Bemerkungen über die periodischen Veränderungen und Erscheinungen in Krankheit und gesunden Zustande des menschlichen Körpers.*—Leipz. 1790. *Salzb. Med. Chir.*—Zeitung. 1791. III. 5.
 Valentini, *Decl. Panyg. n. 3. de Morb. Period.*—Francof. 1701.
 Spurzheim, *Physiog. System.*—London, 1816.
 ———, *On Insanity.*—London, 1817, p. 190, et sequel.
 ———, *Phrenologie, &c.*—Paris, 1818.
On Diseases with Diurnal and Nocturnal Periods.
 Crause, *Dissert. de Morbis Nocturnis et Nocturnis Morborum Exacerbationibus.*—Jena, 1709.
 Scarpa, *Malatie deglie Occhi, (al fino del libro.)* On the Nocturnal Blindness.
 Darwin, *Zoonomia*, vol. ii.—(*Curious cases of*), and Class IV. ii. 4. et sequel.

In order the further to prove the truth of the foregoing remarks, with respect to the casual and periodical influence of the atmosphere on diseases, have I recommended the plan of keeping journals of the weather, and noting down the epidemical and other prevalent complaints in collateral columns. The periods of irritability might likewise be noted, and also astronomical phaenomena. Such journals kept for a long time by physicians of extensive practice in different parts of the world, might lead to very useful results, by exhibiting a large body of collateral and consecutive observations

on the atmosphere, and on diseases and their periods, by which we may be enabled to observe many coincidences at present unknown.

With a view to assist persons in composing journals, have I subjoined the following plan, with a short description of the modifications of the clouds; since the knowledge of these, considered as the indicators of the electric state of the atmosphere, is of some importance to the speculative physician, who is examining the connexion between the health of his patients and the state of the weather.

The journal should consist of 16 columns. The 1st column should contain the day of the month, 2d the hour of observation, which ought to be made at least three times a day, if possible, viz. 9 o'clock in the morning, noon and midnight. Those who are able to employ a person expressly to keep the register, should make five more observations, viz. at sunrise, being the coldest time; at 2 P. M.; and at 2 in the morning; because the crisis of symptoms of diseases with daily periods often happens at these times; at 6 P. M., because there is likewise, in many cases, an exacerbation of symptoms about this time. Though I have observed this period to fluctuate, according to the hour of dinner, having been established, I believe, by the exertion of digestion, yet it afterwards goes on periodically, independent of eating. It is to be noted that 9 A. M., noon, and 6 P. M., are also barometrical periods. The 3d column should contain the barometer; an R or an F should be placed after the numerical denotation, to signify either *rising* (if the mercury have a convex surface), or *falling* (if with a concave top). This will lead us to a knowledge of the time when the maximum and minimum of the day happen. The 4th column, the thermometer. In particularly hot or cold weather, the maximum of the day and the minimum of the night might be taken with a Six's, or selfmarking thermometer, in case we should not have seen it at its extreme points. This might be added in a note. The 5th column, the hygrometer: Saussure's and De Luc's are the best. The 6th column, the evaporation (by a vapourgauge) in 24 hours, taken from 9 to 9 o'clock every morning. The 7th column, the rain fallen, (by a raingauge). The 8th column, the atmospherical electrometer. The 9th column, the electroscope of De Luc.¹ The 10th column, the direction of the wind (by a weathercock). The 11th column, its force (by an

¹ For a description of these instruments and figures, and for descriptions of the modifications of the clouds—See my "Researches about Atmospheric Phaenomena," 2d edit.—Baldwin and Co. 1815.

anemometer.) The 12th column, the modifications of clouds, or nepheological journal. They are as follow:—

1. *Cirrus*, or Curlcloud, a light flexuous or curling cloud generally observed in the higher regions of the air. Sometimes its fibres are straight, and cross the welkin from one horizon to the other.

2. The *Cumulus*, or Stackencloud, an aggregated mass of an irregularly hemispherical form. The common cloud of day.

3. The *Stratus*, or Fallcloud; fogs and mists.

4. The *Cirrocumulus*, or Sondercloud: a bed of separate orbicular aggregates.

5. The *Cirrostratus*, or Wanecloud; a thick shallow cloud, a bed of little barred or streaked clouds, with this character. It is always in a subsiding state.

6. The *Cumulostratus*, or Twaincloud. The rocklike and mountainous clouds before storms.

7. The *Nimbus*, or Raincloud, immediately causing the *Imber*, or shower of rain.

The 13th column should contain the general remarks on the weather. Occasional phaenomena, as halos, meteors, the calendar of Flora, &c. &c. The 14th column, the diseases in particular. The 15th column, the periods of irritability; and the 16th column, the place of the moon.

Various miscellaneous notes might be added. As the appearance of migratory birds, the diseases of animals, &c. &c. These journals, kept in different places, and published collectively, like the Meteorological Registers of the Palatine Society of Meteorology, would be useful and interesting.¹

¹ A very copious Journal of the above kind has been kept at Walthamstow, in Essex, for upwards of forty years back, which I hope to have leisure to consult, and to give the substance to the public.