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WHAT THEN?

THE PROBLEM OF THE EXHAUSTION OF COAL.*

BY PROF. L. SOHNCKE.

I.

THE QUESTION.

WHEREVER we look about us we see on every side products of human industry in the creation of which coal has directly or indirectly played a prominent part. From coal we prepare our illuminating gas. We get our iron and other metals from ores burnt in furnaces the heat of which has been generated by coal. By it the stoves of our homes are heated. Coal is the indispensable fuel of the steam-engines whose thousand-fold applications procure us the countless conveniences of modern life. Locomotives, marine engines, transportable motors, hydraulic mining-machines, and all kinds of steam-pumps, machines employed in rolling-mills, fans, circular saws, steam-presses, and hundreds of other mechanical contrivances are dependent upon steam-power and consequently upon coal. So, too, the gas-machines so much used to-day in smaller industrial operations, owe their power to do work to coal; and thus indefinitely.

In view of this dominant position that coal occupies in our present civilization, the question appears perfectly justified as to whether the coal-supply of the earth, at least so far as human needs are concerned, is inexhaustible, or whether we must prepare ourselves for the future termination of all our present splendor. This question was raised long ago. In 1866, the English Parliament appointed a special commission for its investigation. Does not, indeed, the entire wealth of England rest substantially in its treasures of coal! The question, moreover, has been repeatedly discussed in addresses and essays, especially by Dr. Wm. Siemens; and other scientists (Grashof and Clausius) have also given the subject exhaustive consideration. The results are of deep interest.

If we measure the earth by the standard of our own body it appears gigantic. And the majority of the species of rocks of which it is composed are present in a correspondent degree: of Granite, Gneiss, Porphyry, Slate, Lime-Stone, Sand-Stone, and other

* From *Himmel und Erde*, by *jujqs*.

kinds of rocks, there are enormous quantities. But the case is quite different with coal. The different geological formations that in the course of millions of prehistoric years have been deposited upon the bottoms of the oceans and of inland lakes, and which, freed by slow processes of stratification from the waters that covered them, now serve the human race as a play-ground for its struggles, exhibit indeed here and there between their layers of sand, clay, and lime, occasional strata of coal. But of real importance, by reason of the great abundance in which it is found, is the coal of but one of those formations—the formation of the carboniferous era. At the time of its deposition swampy lowlands extended for immense distances along the coasts of continents and islands; broad flat swamp-areas, exposed to frequent inundations, spread out along the courses of rivers. All these low tracts were filled with turf-moors and swampy forests, which in a uniformly warm and moisture-laden atmosphere flourished in romantic luxuriance. These primitive forests and moors it is whose slowly decayed remains we see before us to-day as coal. The conditions, whether for the formation of such gigantic vegetable accumulations, or for the preservation of their carbonated remains, were never afterwards present to the same extent, and so far as human foresight can determine will never recur in the future. In all civilized states the forestry laws require that the greatest possible equilibrium shall be maintained between the consumption and the fresh growth of timber. But where such supervision is lacking [as is the case in some of the United States] man destroys much more vegetation than is spontaneously reproduced—this is true not only of the consumption of wood but also of the consumption of turf. And so it happens that accumulations of plants that could form beds of coal are at present to be found hardly anywhere.

Coal, therefore, represents for us a certain amount of capital that is not to be increased, that bears no interest, and that is by no means inexhaustible. And humanity goes on with the consumption of coal like the fortunate player that drew the grand prize in the lottery and knew no better than to squander his newly acquired fortune as quickly as possible. We, in fact, and especially since the invention of the steam-engine, are wasting in the most irresponsible manner our

capital of mineral coal that we cannot replace. How long is this to last?

The answer can be given, with approximate certainty, on the basis of the condition of things in England, which have been closely studied. England belongs to the most richly endowed of civilized states in this respect; its "black counties"—South Wales, Northumberland, Durham, Lancashire, and others—are world-famous. Of the entire coal-area of Europe, more than one third lies on the British Islands. These yield almost one half of the entire coal output of the earth, which amounts annually to about three hundred million tons. Now Siemens finds, upon the basis of the investigations of the English parliamentary commission already mentioned, that the quantity of minable coal in Great Britain is estimatedly equal to one hundred and fifty thousand million tons. Of this in 1877 the annual output was about one hundred and thirty two million tons. Whence it is calculable that the coal fields of Great Britain, reckoning from today, will be exhausted in some two hundred and fifty years. This estimate may indeed not be absolutely reliable; the day of terror may be deferred for three or four hundred years: yet what are a couple of centuries in the life of humanity!

We are thus directly confronted with the fact that the coal-supply of England, and likewise that of all Europe, will be exhausted at a time not far distant. And although non-European lands still possess great stores of coal, the end awaits them also; and the question unavoidably arises—What then?

Are things really so, that it is granted to the present generation, or shall we rather say to the present generation and those that immediately follow, to rejoice in the highest fruitions of civilization, while soon thereafter humanity is to sink back into barbarism? Shall we continue frivolously and wantonly to squander the fortune that has fallen in our laps, and say: *Après nous le déluge*. Have we not also duties to fulfil towards the coming generations?

(TO BE CONCLUD. D.)

IS NATIONALISM A SIN AGAINST LIBERTY?

BY T. B. WAKEMAN.

"Order, the condition of liberty.

Liberty, the mother of improved order."

THERE is a widespread and profound misapprehension about the relation of Nationalism to Liberty which a little attention to the laws of sociology should remove. We read, for instance, in the *Twentieth Century*, of June 12th, Hugh O. Pentecost's opinion, which, many hope is only temporary. He says: "I admit that it (Nationalism) would distribute wealth more equitably, that it would abolish poverty, but individual liberty would be the price paid for those blessings, and they are not worth the price."

Then he goes right on and quotes, and replies very cunningly, evidently as he thinks triumphantly, thus:

"The 'Pacific Union' also objects to my foregoing paragraph. It says:

Nationalism (the control of an entire people under one governmental system) established for the benefit of the whole—to sustain the rights of the whole—is not tyrannous, nor can the most rabid Anarchist make it so appear.

It is all very well to say that, but read what follows:

What Mr. Pentecost contends for is that those who do not desire to cooperate should not be compelled to do so; if they are compelled, that is tyranny. But he seems to forget that the good of the whole is paramount to the good of the few.

There you are, you see: 'The good of the whole is paramount to the good of the few.' Is not that the time-honored maxim of majority rule, a maxim that is now used to justify policemen and prisons? Now, good friends, you might as well admit that the only difference between our present governmental tyranny and injustice and Nationalism is, that now many are ruled for the benefit of a few, while under Nationalism a few would be ruled for the benefit of many. I admit that that would be an improvement, but it would be tyranny, all the same. If not, why not?"

If these disputants would bring their difficulties and differences under the light of evolutionary sociology, would they not disappear? Let us see.

Nothing can be more important than to get down to scientific bed-rock on this subject, for we can never do anything right in social affairs, economics, or morals without *that* foundation. In *The Open Court* of May 29, we answered the question, "Is Nationalism a sin against Hell?" and in so doing called attention to the controlling fact that "Society is an organism," and that there is no use in discussing social questions if such fundamental facts and the laws pertinent to those subjects are to be persistently ignored. For instance, the disputants above quoted speak of "rights," and the will and wants of the individual as though all human affairs were purely voluntary or involuntary, and independent of the organism. A moment's thought will enable any one to see that this is shallow, unscientific talk. For if society is an organism, the first and main question is, What is the nature, extent, and proper limits of its *organic* action? When those questions are answered, and the duties they enjoin are provided for, we may begin to chatter about our "rights" and "wants."

It is the glory of Nationalism that of all the "Reforms" of our time it is not metaphysical. It proposes to actually do something practically, and on a basis that does not begin by upsetting the order and science of the world. It proposes to follow simply the evolutionary progress of that order and science intelligently, instead of being forced forward by the blind social forces of Nature with our backs instead of our faces to the dawn—a most ungraceful and unintelligent way of entering heaven, at which the angels will surely laugh!?

The Nationalists scientifically turn their faces to the light in their "Declaration of Principles," thus:

"We merely seek to push (follow) this principle (co-operation) a little further, and have all industries operated in the interest of all by the Nation—*The People organized—the ORGANIC UNITY of the whole People.*"

These are most important words because they are scientific. They should have admonished our disputants that we are all living in and are parts of a vast organism—an organic world, with an inevitable organic action, co-operation, *end*, and consequent "UNITY."

Now the great fact is that this organic action is as deep as the world. It includes not only the evolution and movements of the solar system, and our own "mother and nurse, the Earth," but also all of the plants, animals, and *species* which she has produced, including the great society, MANKIND, with its manifold growths, combinations, and their stages of progress. *We* stand as the outcome and apex of this mighty pyramid resting upon the stars and rising step by step through inorganic matter to the vital and then to the human and social.

Each individual is simply its last growth, the highest of all and the product of all, but thus subject to all its organic action and laws, and possessed of life, health, strength, enjoyment, happiness, and in a word, *liberty*, only as he fulfills and develops his *individuality* along the lines of growth and *least resistance*, which are those laws.

Now the first thing to be always borne in mind about these facts and laws is, that they are scientific and as we said *inevitable*. To say "that those who do not desire to co-operate should not be compelled to do so; if they are compelled that is tyranny"—is to talk, (we beg pardon) very absurd and unscientific nonsense. There is no will nor compulsion about this co-operation. It is a fact, fundamental and *organic*, not voluntary nor involuntary—whether we consider it as solar, terrestrial, material, vital, *social*, or *moral*. Our ex-Rev. friend, Mr. Hugh O. Pentecost, is indeed awful spry. He can spring from a pulpit or a system of theology with a speed that makes many, and perhaps him a little dizzy, but we challenge him and defy him to secede from the solar system! Even the great burly Jupiter could not do that. Nor more can he secede from Mother Earth and her little family of plants and animals and human society with its *organic* co-operation and social laws and moral duties. The only escape from all these is to go out of life. This organic action is the cause, creator and sustainer of every individual. The civilized individual could no more exist and live without society than the hand without the body. Like the hand the civilized individual has no existence natural or healthy except as an organ of the body which produced it. So we can exist only as we "are members one of another."

If it is said, all this is a truism—an old chestnut. We reply that this is just the trouble. Fundamental facts and laws are enduring and never to be forgotten. Our anarchistic friends talk and try to act just as though they were metaphysical individual entities having no laws, conditions, nor duties, except to flirt and dance in the infinite space of their imaginations as their sweet wills may *seem* to waft them.

Then we are asked, how about the *will* and *self*—and all that? Are we not *free*, and the result and object and finality of everything—each in, for, and to him or her *self*? Yes, for the growth, purposes, and enjoyment of the individual standing upon these laws and with constant relation, conscious or not, to the social organic *whole* of which the individual life is a *function*, or else a robber. The best illustration is to compare the function of the *will* in the body physical, and then in the body *social*. In the physical body most of the organic action which is fundamental has already become not only involuntary but unconscious. The action of the great organs, like the stomach, heart, and brain, is only thought of when diseased. Carlyle complained bitterly that his happiness was wrecked by his unfortunate discovery of his stomach. So, generally, the acts *necessary* for the system, are at first voluntary and conscious, and then, like walking, they become usual, natural, involuntary, and finally organic and *inevitable*. Thus all of the material nutritive processes and conditions go on as a matter of course, like the stomach and heart, and the *will* is chiefly occupied *consciously* with the newer and unexpected matters which confront the organism, and where the choice is the strain between motives, and is determined by the highest.

But unconsciously, organically, necessarily, and naturally, the *will* of the individual is occupied in supplying the stomach, the heart, and the brain with the materials that sustain their organic action—making life and health possible. This *organic will* is simply the co-operation of the whole system, every organ and part thereof joining in this common *consensus* for the obtaining of food and the conditions of existence necessary to the whole organism. This *consensus* of all is not voluntary nor involuntary: it is organic, natural, *inevitable*. It is not a "governmental tyranny and injustice" but the common action of all worked out by natural selection for the benefit of all. Prolonged meditation upon Æsop's fable of "The Stomach and the Limbs" ought to be imposed upon every Anarchist who complains of the "tyranny" which compels his hands and *will* to supply his stomach, or die. They must learn to apply this fable to the *body social*. The *consensus* of the people is *the will*, and government of the whole organism, in which all of the just powers are "the *consent* of the governed." To say that such

consent is a tyranny is to be guilty of an organic falsehood. To say that you wont give, join in, or have anything to do with such a "consent" is to be guilty of organic suicide. It is simply to secede from manhood and civilization—and to die—making usually a dirty nuisance of one's self, as in deaths by slow alcohol-poisoning. Darwinism, indeed, shows that in every community there will be a few rudimentary specimens of incomplete development who do not become capable of co operative civilization. These are provided for now, and will continue to be cared for in institutions in which physical and moral deficiencies will remain a warning to all, while being remedied as far as possible.

Substantially there can be no society or civilization without this co operative organic action of all its members. Every one by being born consents to this fact and condition just as he consents to the solar system. This fact is not a tyranny at all, because it is a condition of existence. We accept it by accepting civilized existence. This is the "If not, why not," to all notions, that the organic action of the social organism is a tyranny. It is not a tyranny because it is one of the conditions of existence, like the law of gravitation. It is the order of social action upon which the safety, existence, and welfare of each and all depends. To thus speak of organic laws as "tyranny all the same," is simply a theological anthropomorphism. Its history is curious. It is a cross between Rousseau and Paley. A century ago Theologs taught that a God created nature and *imposed* laws to which all were *made* to submit, and that the laws of the state were simply a similar imposition. The Anarchists are our theological "survivals." They still talk and act as though *law* was an imposition of authority divine or human, and therefore to be violated in order to assert and vindicate liberty!—and that law is thus simply another name for tyranny. It is a thousand pities that our "H. O. P." cannot jump off of this theological shadow. For this idea of law is wholly out of date. In the modern scientific sense, law is the reverse of tyranny. It is an observed order of phenomena or events, even in social science, as among the stars. It is the line of least resistance, and synonymous with consent and liberty. It is the line or order in which things go because they *then* go without restraint, the easiest and freest. The law and order of the world is simply the record of its freedom. In so far as we conform our lives to its order, we are free. When we conquer, as Bacon said "by this obedience," we are emancipated from restraint.

Thus says Goethe :

"Art and Nature are one,
And the law *only* can to us Freedom give."
("Und das Gesetz *mer* kann uns Freiheit geben.")*

* See his Sonnet "Natur und Kunst."

There can be no law without order in phenomena, and so in human actions order is the necessary condition of any certain and free activity. Where no one knows what will happen or what people will do, there is no freedom to do anything, and civilization cannot rise above barbarism. Liberty never began until the *order*, first observed in nature, gave some certainty and freedom to human effort, and then the consequent increasing order and law of human societies made the increase of freedom possible. Thus, order was and is ever the condition of Liberty: the base of progress. But equally true is it that Liberty, the choice of the line of action most easy, safe, and beneficial to the actors must, and has become the common action, order, and hence, *law*, which has sustained, an ever higher liberty. Thus in turn "Liberty is ever the mother of an improved order." The static is ever the base of the dynamic: while the growth of the dynamic ever broadens its static base.

Exactly in this spirit Nationalism comes to restore in our country the *conditions* of liberty and individuality, by conforming to the natural organic laws of our National existence and progress, and making them the basis of secured liberty. Tyranny is simply monopoly: it is organic action stolen and misappropriated. It is the use of social power for the selfish gain and ends of the tyrant. The ancient tyrants were political: the modern are industrial. The remedy is the same: the organic action of the people must replace them. In the physical body this action first comes in play for protection, and then to feed and sustain. So in our body social, the first function of government was exercised to protect our liberties by war, as our fathers did against a foreign foe. But now civilization in its evolutionary advance calls for organic action to defend the people from the internal foes of monopolies and the "wolfish competition of selfishness." The monopolists and anarchists combine to defeat this onward step of civilization and liberty. Both of them are retrogrades. The true line of progress is unmistakably that by which *organic action* can defend every member of the commonwealth from foes not only abroad, but *at home*, by placing under him, at least the necessary conditions of life, liberty, and the *opportunity* to achieve some happiness by the performance of some duty.

The notion that the organic provision of these conditions will breed only a herd of "human cattle," has no support in fact or theory. It is only the immoralities and degradation enforced by merciless competition and "Poverty's unconquerable bar," which represses the noble in human nature, and develops the cunning, the selfish, the mean, and the contemptible.

If the notion is, that a secured material sustenance will give a sameness of character, life, and pursuits ;

the very opposite would evidently result. There would naturally be a multiplicity; for, every divergence of taste, character, and pursuit would have a freedom of development hitherto unknown and otherwise impossible. Every "sport" would then give a variety, to be continued if of value. The flowers of the garden,—were they able to co-operate and provide the most nourishing soil and the proper situation and room for growth,—would they grow all alike? To provide these conditions of success and multiplicity for the flowers and the plants, we even now have a Department of Agriculture. But for the flowers and virtues of human nature we have no support, no organic protection. We turn *them* over to the cruel mercies of brutal, immoral competition in the race for wealth and power as the *sole objects* of life, and *then* talk of the depravity of human nature. And clergymen *in* the pulpit, and, alas! some *out*, cry—*Amen!*

LOCALIZATION OF BRAIN-ACTIVITY.

III.

SENSORY CENTRES.

The most important motory regions of the human brain are, according to all authorities on the subject, situated around the fissure of Rolando. There is less agreement concerning the sensory centres. The optic centre is situated, according to Meynert, Munk, and Huguenin, in the first, second, and third occipital lobes; according to Exner, in the first and second only, and in the upper part of the cuneus.

The acoustic centre lies in the temporal lobes. Irritations of these centres cause hallucinations of hearing. In post mortem examinations Huguenin found the temporal lobes of deaf patients in an atrophied condition.

The centres of taste and smell are, according to Ferrier, supposed to be situated in the *uncus gyri fornicati*.

The tactile centres, according to Trippier, Exner, Petrina and others, must be sought for in the regions of their respective motory centres.

The frontal lobe does not contain either motory or sensory centres. It seems to be in the service of more abstract kinds of mental activity, and is most likely also the seat of affectionate and emotional centres. Defects of this part, be they acquired or inherited, are as a rule accompanied with idiocy or lack of intelligence. Monkeys in whom the frontal lobes were removed, showed no irregularities in the exercise of their motory and sensory functions; yet they appeared more whimsical and less affectionate than before.

EXPERIMENTS UPON ANIMALS.

It is a strange fact that the hemispheres as well as the corpus striatum exhibit no sensitiveness to pain

whatever. They can be cut, irritated, or maltreated in any way without causing direct suffering.

Experiments have been made to deprive animals (mostly pigeons, hens, and frogs, but also dogs) of their entire hemispheres. A pigeon without its hemispheres stands firmly on its feet if only the cerebellum remains unimpaired, but has lost all signs of intelligence. It behaves as if it were asleep. It will stand quietly in one place for hours and hours.

A brainless pigeon is without clear consciousness because it has lost all the memories to which sensory irritations may be referred. Yet it is not entirely void of feeling. The sensory and motory nerves perform their functions as usual, and with perfect harmony. The pigeon "quivers if a pistol is shot off near by; its eye winks at the approach of a flame, and the pupils contract. It turns away from ammonia vapor" (Landois). Its consciousness however, if consciousness it can be called, is limited to the moment and to that one sense-impression which takes place at the moment. This sense-impression remains isolated, it cannot be compared with former memories. Thus it remains understood, and is quickly forgotten.

Hens endure the operation better than other birds. For a few hours, they lie exhausted; then they rise and remain in a sitting posture. Again, after hours, they walk about, scratch the floor of the room, and after a few days they begin pecking for food, although there may be nothing on the ground. Some hens learn again to eat and drink, if water and food is put into their bills, and thus can be kept alive as living automatons for several months. (See Exner in Hermann's "Physiologie," Vol. II, Part II, p. 199.)

Frogs preserve perfectly their equilibrium after removal of their hemispheres. If turned on their back, they will rise to their feet. If irritated, they will make two or three jumps, with a view to escaping. If thrown into water, they will swim until they touch the wall of the basin; then they will creep up on the edge, where they remain. In all motions producible as direct reflexes upon their proper irritations, they show a perfect mastery of their limbs and harmony of movement. Yet without irritation there is no motion; there is no spontaneous voluntary action whatever. A brainless frog, if left to itself, will remain quietly on the spot where it has been placed, as if asleep; it will take no food, betrays no consciousness of hunger or thirst, shows no sign of fear, and unless artificially fed, will in time dry up like a mummy.

That which in animals and in man appears to us as spontaneous and voluntary motion, is the result of cerebration among the memory-pictures of the cortex, acting, as we suppose, in co-operation with the corpora striata. When the memory-pictures have been removed, an animal is unable to act except in response

to sensory impressions, that is by direct reflex-motions.

* * *

Goltz invented a new method to remove the hemispheres of animals, which has the advantage of causing less irritation than the scraping them out with a knife or a sharpened spoon. He injected through small apertures in the skull a jet of cold water, and thus succeeded in washing out the cortex without injuring other parts. Goltz distinguishes two kinds of effects: those which after some time pass away and those which remain for good. The former are mere temporary disturbances, while the latter alone can be considered as a loss of functions which have their seat in the removed parts.

A dog that has been deprived of the greatest part of his cortex is, as Goltz expresses it, an extremely complex reflex-mechanism that eats (*fressende Reflexmaschine*). He behaves like a perfect idiot, walks slowly and awkwardly, with the head downwards. His sense of touch all over the skin is obtuse. He shows a lack of information concerning the surrounding world and his own body which is mainly noticeable when he is fed. He sees, but like a sleep-walker who avoids obstacles without being aware of what they are. He hears, for he can be roused from his sleep by loud calls, but he hears like a man who is but half-awakened from a profound sleep and has not as yet recovered his full consciousness. The disturbances of all the other senses are analogous. He howls when hungry, but does not search for food. If fed, he eats until his stomach is full. He shows no indications of sexual instinct, and is generally without any interest or sympathy.

PSYCHICAL ACTIVITY. THE ORGAN OF CONSCIOUSNESS AND THE SEAT OF INTELLIGENCE.

The motory as well as sensory centres of the hemispheres must be considered as psychical regions; that is, they are the places in which the action of the nervous mechanism may be and often is accompanied with consciousness. This is corroborated by the fact that an irritation of these regions does not produce the usual result in new-born animals; their psychic activity is not as yet developed and a few fibres only are differentiated in the white nerve-substance of their hemispheric region. In further support of this the circumstance can be adduced (according to Schiff), that these cortical centres cease to work if the animal manipulated upon is kept under the influence of chloroform or other narcotics.

Consciousness is the most complex and concentrated form of feeling. Feelings, we can fairly assume, may take place in all the innumerable cells of our body so long as they are alive. But these feelings are ex-

remely weak and by far the greater part remains isolated. Feelings, we assume, depend upon a special form of activity in animal substance. The sensory fibres of the nervous system are a mechanism constructed to co-ordinate and concentrate the various feelings; while the motor fibres co-ordinate the reflex-activity in such a way that it may be subservient to, that is, it may act upon irritations received from certain co-ordinated centres of feeling. The final concentration of both activities, sensory as well as motory, takes place in the hemispheric region and it is in this final concentration that consciousness is produced.

Meynert considers the whole nervous mechanism of man as "three superordinated systems of projection." The first or highest system of projection is the corona radiata, comprising all those tracts which connect the hemispheric ganglions, the thalamus, and the Four Hills. As the second system of projection Meynert describes the course of fibres from the great ganglions (*viz.*, thalamus, Four Hills, and corpus striatum) to the central gray substance which forms the walls of the aqueductus Sylvii and the bottom of the fourth ventricle.

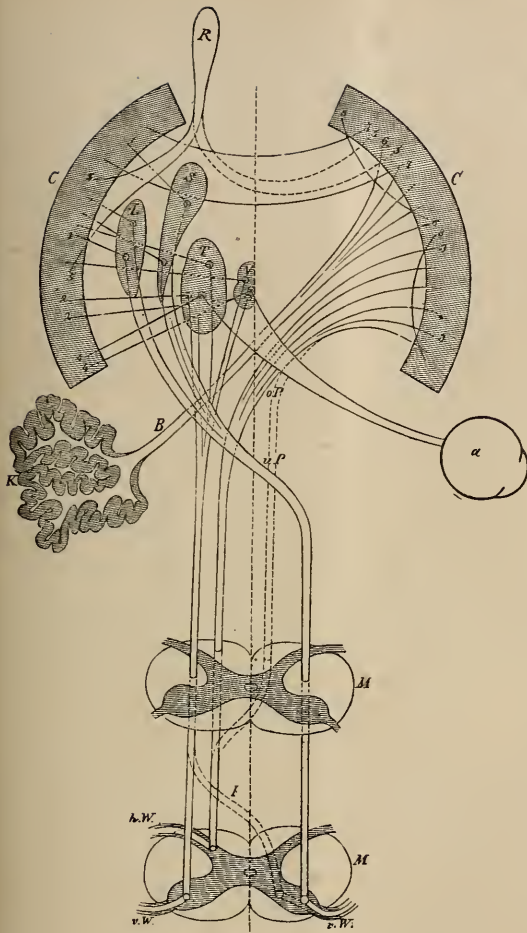
In the accompanying diagram representing Meynert's view of the nervous system, the lines connecting *T* (thalamus) with *v IV* (anterior root of spinal cord) are paths of reflex motions descending from the thalamus. Their presence is proved by the fact that after the destruction of the voluntary motor tracts an involuntary mobility is preserved which can be produced through simple reflex-action so long as the thalamus remains unimpaired.

The third system of projection are the fibres below the central gray substance, namely the motor and sensory nerves which connect this part of the nervous system with the periphery.

The cerebellum forms a central organ of its own, being in connection with the hemispheres, the pons, and the medulla.

Every system of projection from the most peripheral to the most central, from the third to the first, is a further concentration of feelings and of their corresponding motor reflexes. The first system, which is the highest and most centralized, is alone the seat of consciousness. Accordingly no feeling, no sensation, nor any motion, can become conscious unless it be projected into the hemispheric region. All sensory irritations which do not rise into, and all motory reflexes which do not originate from this highest region—remain unconscious.

We say that no nerve-activity except that which is projected into, or takes place in, the hemispheres can become conscious; but we do not say that all the nervous activity of the hemispheres does become conscious. Many most complex actions, motions as well



MEYNERT'S REPRESENTATION OF THE NERVOUS SYSTEM.

(After Meynert's investigations; reproduced from Hermann's *Physiology*, Vol. II, part II, p. 303.)

- C. Cortex of hemispheres.
- L. Lenticular body.
- S. Tailed body (nucleus caudatus).
- L. and S. are the hemispheric ganglions, called Striped Body.
- T. Thalamus.
- V. Four Hills.
- R. Olfactory nerve (*Riech-Kolben*).
- A. Eye.
- K. Small Brain or Cerebellum.
- B. Brachium ad Cerebellum. (*Bindearm.*) Tracts connecting the Small Brain with the hemispheres.
- h.W. Posterior (sensory) roots of spinal cord.
- v.W. Anterior (motor) roots of spinal cord.
- M.M. Two sections of the Medulla in the spinal cord.
- 1. 1. Voluntary motor tracts, passing into the lenticular L and tailed bodies S, whence they issue downwards. They form part of the crus cerebri crossing over to the other side in the inferior pyramidal decussation (*u. P.*), and descend to their respective anterior roots in the spinal cord.
- 2. 2. Involuntary motor tracts. They pass from the cortex into the Thalamus T and the Four Hills V, whence they issue downward to their anterior

roots forming part of the tegumentum. If there is any decussation in these involuntary tracts, it can take place in the spinal cord only as indicated in the dotted lines near I.

- 3. 3. Sensory tracts, crossing to the other side and forming the superior pyramidal decussation, in *o.P.*
- 4. 4. Optic tracts.
- 5. 5. Olfactory tracts.
- 6. 6. Cerebellar tracts of B.
- 7. 7. Commissural fibres, connecting both hemispheres.
- 8. 8. Commissural fibres interconnecting the different provinces of one hemisphere.

as sensations, and even long chains of logical reasoning which can have their seat in the cortical substance only, are performed unconsciously. Accordingly, it is but a small part of the cerebral activity that enters into consciousness. Only the mountain peaks of cerebral nerve-activity if they rise through a process of further co-ordination above the great mass of subconscious states are illumined by a glow of concentrated feeling or consciousness.

Meynert's investigations have been modified of late by Wernicke* in so far as Wernicke demonstrates that the Shell (putamen) of the lenticular body and the nucleus caudatus do not receive fibres from the corona radiata. They form no intermediate stations between the hemispheres and the periphery. This function has to be limited to the inner stripes of the nucleus lentiformis (which are called the globus pallidus). The Shell forms a terminus of its own quite analogous to the cortical region.

If we compare the thickness of the corona radiata with that of the crus cerebri, we find that the former must contain by far the greater number of fibres. Some fibres are continuous, passing from the cortex through the internal capsule directly into the crus. Other fibres of the corona are indirectly connected with fibres of the crus by intermediate stations in the stripes of the globus pallidus. A good number however must be lost in the striped body. This reduction of fibres indicates that the striped body must contain a place which stands in some intimate relation to the cortex—more so than to the crus. The connection of the striped body (so far as it is not a mere intermediate station) must represent some special function, which seems to reduce or concentrate cortical activity, as if it were another system of projection, superordinated upon that which is represented in the relations between the thalami, Four Hills, etc., and the cortex.

The cortical activity is supposed to represent the terminus of the whole system of projection. Yet this great and wide area of gray matter cannot properly constitute the central seat or organ of consciousness; it represents rather the store-house of old experiences; it is the seat of intelligence.

Intelligence, physiologically expressed, is a great wealth of well-associated, i. e., well-interconnected

* Wernicke. *Lehrbuch der Gehirnkrankheiten*, Cassel, 1881.

and systematized, memory-structures. Consciousness and intelligence are not identical. We know for certain that intelligence and consciousness are radically different. Long chains of logical reasoning may take place without any consciousness. We may also, and often we do, unconsciously execute most complex movements that are expressive of intelligence in so far as they adapt themselves to special circumstances. In jumping, if we have any practice, we measure with our eyes correctly any given distance, and the motions of our limbs will be exactly adapted to the occasion; and yet this process of judgment does in rare cases only enter into consciousness. Word-memories have unquestionably their seat in the cortex, and yet there are many instances where fervid oratory flows from the lips of a speaker with unconscious ease. Similar acts of unconscious mental activity are performed in all kinds of gymnastic exercises, by piano players, and in innumerable other ways. While writing an author spells correctly without being in the least aware of it; and indeed all conscious thought is everywhere permeated by, interlaced with, and, as it were, carried on the pinions of, the activity of unconscious intelligence.

The function of consciousness consists in a certain stimulation of the different ideas registered in the hemispheres. The nervous battery which discharges these irritations, causing thereby now in this now in that part of the cortex an increase of blood circulation, may be called the seat of consciousness. Accordingly, consciousness, physiologically considered, would be the effect of this nervous battery upon those nervous structures with which at the time it stands in connection.

The seat of consciousness must be situated in some ganglionic organ of co-ordination. It seems as though this organ can be sought for only in the Striped Body, perhaps in the shell of the nucleus lentiformis. The Striped Body being a part of the hemispheric region must, for ontogenetic and other reasons, stand in some such relation to the hemispheres. The corpus striatum develops in the same ratio as the hemispheres, and if it is irritated by an electric current the result appears to be the same as when the motor centres of the cortex are all excited at once (Landois). Destruction causes hemiplegia (paralysis on the opposite half of the body), which often is accompanied with hemianæsthesia. Further verification of this hypothesis, that the organ of consciousness is to be sought for in some part of the Striped Body, must be expected from pathological and experimental observations.

Consciousness, if extraordinarily intense and concentrated, is called attention. Attention is nothing but a concentration of feeling in order to prepare for

and execute an act of motion. Attention is not motion. It is rather a temporary suppression of motion, but its final end and purpose is always the execution of some motion or a series of motions adapted to given conditions. Reading, studying, observing in order to understand something, are as much motions upon which conscious mind-activity can be concentrated, as is the catching of prey by animals. In a state of attention all feeling is focused upon one aim, in order to prepare in an act of deliberation, and after due preparation to serve as an irritant for, a specially adapted motion.

The unity of consciousness, accordingly, must be conceived as the product of concentration. Many feelings converge upon one point, aimed at by the irritant for action. The effect of their co-operation is an attitude of which concentrated action or desire for action directed upon one common aim is the characteristic feature. Consciousness, therefore, is neither a material nor mental essence, but it is a special state of mind. The unity of consciousness is not an original and innate quality which makes attention possible; its unity is a unification. The unity of consciousness is no intrinsic quality of mind; it is imposed upon the mind by the object of attention, which like a magnet attracts all its tendencies to motion, and thus produces in them and among them a systematic arrangement so that they all are subservient to one plan of action.

The physiological mechanism of consciousness is an unsolved problem still. If our hypothesis, that the Striped Bodies must be considered as the organ of consciousness, should be confirmed and proved, the question might be raised, Why can we not concentrate our attention upon two different objects at the same time? Why cannot one corpus striatum concentrate the consciousness of one hemisphere upon one kind of work, while the other concentrates that of the other hemisphere upon some other subject?

A satisfactory answer to this question cannot be given until we know more of the construction and mechanical action of the brain and especially of the cortical ganglions. Until then we must be satisfied with a preliminary answer. If consciousness is the common direction of mind-activity, its unity need not be constituted by, or rest upon, one unique organ. Thus a carriage may be drawn by two horses, hitched side by side and directed towards one common goal. If consciousness or attention (i. e., the concentration of consciousness) is not a unity but a unification, we need not search for one single and unique organ of consciousness, as did Descartes, who for this reason assumed the seat of the soul to be the pineal gland. Being simply a state of mind produced through a certain attitude of concentration, consciousness may have

its seat in two or even in several organs. It will obtain so long as a common direction governs the single parts of an organism; and it need not depend upon the uniqueness of its organs.

We can illustrate the state of attention by the phenomenon of vision. If our attention is concentrated upon one object which we see before us, we need not, like the marksman, shut one eye; but we may let the axes of both eyes so converge that the object of our attention is placed at the centre of vision of both eyes. The unity of vision and also of consciousness consists in this convergence; and although there are two pictures, one on each retina, and two cortical images, one in each hemisphere, the object is nevertheless perceived as one only. The concentration of mental activity may take place in both Striped Bodies at the same time. So long as it converges upon one object, so long as it is concentrated upon one and the same idea, it will be felt as a unitary state of consciousness.

It is more than probable that the mechanism which produces this mental convergence of consciousness works as automatically in normal brains, as does the co-operative adjustment of the motions of our eyes. And in spite of the wonderful result produced, it may be, and I am firmly convinced that it is, not much more complicated than the unification in the activity of our two organs of vision.

P. C.

WOMAN AND THE TARIFF.

BY F. M. HOLLAND.

THE agitation about protectionism has some resemblance to that about slavery; and it is especially to be noticed that each movement has had an utterly unpractical set of champions, in addition to its advocates on practical, common-sense ground. Abolitionism, however, had the good fortune of numbering among its most active supporters many of our noblest women, like Lucretia Mott, the Grimké sisters, Abigail Kelly, Lucy Stone, and Harriet Beecher Stowe; but no woman has made herself equally prominent against our tariff. Miss Kate Field has recently spoken with some effect against the duty on works of art; and all artists are with her; but there has been no general opposition of women, as such, to the prevalent idea, among the men at Washington, that pictures, statues, and engravings are mere luxuries, which ought to be taxed. If women really do think that culture of taste has some value in education, and that it would be a national misfortune for us to lose the Angelus, now kept in Canada like a fugitive from justice, by our tariff, it is high time to have the feminine view come to light. What does the fair reader of French, German, and Italian books think of a duty designed to keep them out of her hands, lest they should hinder her patronizing some American publisher? And is the tax of fifty per cent. on gloves wholly satisfactory to that sex for which they are necessities of life, to almost as great an extent as pocket handkerchiefs? No woman, at all events, would put sewing silk among her luxuries; and that is taxed thirty per cent., like the Angelus.

By far the worst case is that of woollen goods, most of which are under a double tax of thirty-five cents per pound and thirty-five per cent. of their cost in Europe: the result is that a poor woman who wishes to buy a shawl or a dress-pattern, of a coarse,

cheap kind, valued in the Custom House at not more than forty cents a pound has to pay a tax of one hundred and twenty-two per cent. To get an article which she could have for \$10, if we had free trade, she is forced to pay \$22.20. I take these figures from a full list of duties, compiled by J. A. Linquist, and published last September by the Reform Club, 52 William Street, New York. It must be noticed that while the manufacturer is protected by the thirty-five per cent tax, that of thirty-five cents a pound does not protect the manufacturer but only the wool-grower. The real state of the case is something like this. A poor washerwoman buys a cheap shawl, and tells the shop-keeper to cut off enough coarse heavy cloth to make \$10 worth of goods. He takes the money from her; but, before she can get hold of the bundle, the man who owns a big factory in her village steps up and says, "Stop a moment, you can't have those goods for \$10 unless you will pay me \$3.50 for my protection." She does not see how it is that he needs to be protected more than she does; but she pays what he asks and is about to go off with the bundle. A heavy hand is laid on her shoulder, however, and another plump gentleman, with a big diamond in his shirt-bosom, says: "Don't forget me. I am the gentle shepherd; and I want to be protected too. Just hand over \$8.70 as quick as you can, for I'm in a big hurry to-night. I am going to give that needy manufacturer a champagne supper; and it won't do to get late." This time the washerwoman tries to get away with her bundle; but she is told that she is in danger of being arrested for smuggling; and away she goes with an empty wallet and a heavy heart.

Such scenes would take place in every store, if the taxes were collected directly from buyers at retail, instead of being collected from them indirectly through middle-men. It must not, however, be supposed that all women are taxed so heavily. Suppose the wife of the gentle shepherd were to buy \$10 worth of woollen goods, valued at between seventy and eighty cents a pound. She would be taxed \$7.80, instead of the \$12.20 levied on the washerwoman who bought coarser goods of what would be the same value, if it were not for the tariff. So again the woman who buys knit goods, valued at not more than thirty cents a pound, is taxed eighty-eight per cent.; but it would be only fifty-nine if she could afford to buy goods worth between forty and sixty cents. If we deducted the thirty-five per cent., levied to protect manufacturers, we shall find that protecting wool-growers costs the poor woman fifty-three cents extra whenever she buys such a bundle of knit goods as she could have for a dollar, if it were not for the tariff, while the rich woman is taxed only twenty-four cents on her dollar's worth. In the case of shawls and many kinds of woollen cloth, the rich woman would be taxed forty-three per cent., to enrich some wool-grower; but the poor woman would have to pay eighty seven, as already mentioned. Thus poor people are taxed twice as heavily as the rich for the ranch-owner's benefit.

A promise to "correct the inequalities of the tariff" was made six years ago by our rulers; and there is a bill now passing through Congress which would increase enormously the prices, not only of woollen goods, but of such kinds of buttons, embroideries, and other necessities of the feminine toilet, as have hitherto been within reach of the poor. It is high time to consider what can be done to protect American women against the tariff.

LIBERTY AND NATIONALISM.

THIS number of *The Open Court* contains Mr. T. B. Wakeman's article, "Is Nationalism a Sin against Liberty?" We are glad to be able to present to our readers the best possible defense that can be made for nationalism, but we do not cherish the fond hope of Mr. Wakeman and Mr. Orchardson, that it can be justified before the tribunal of reason and common sense.

There is a truth in Nationalism which scarcely ever has been doubted except by the most rabid anarchists. If nationalism means the national control of certain affairs, the performance of which is of common interest, as for instance the administration of the law, nationalism has been realized in every civilized society. But if nationalism means the nationalization of all private property, so that all private interests and enterprises shall be regulated by the nation—a state of things such as Mr. Bellamy describes in his novel "Looking Backward"—nationalism is a scheme that scarcely deserves serious consideration. It is at present being greatly promoted, but together with other fashions and crazes it will pass away as soon as people get tired of the monotonous refrain "wolfish competition."

Every civilized society is an organism of co-operating individuals who in their co-operation compete to do, each one in his own sphere, the best they can. Nationalists assume that if all enterprises, all business, all manufactories, all farms, all trade, were run by the nation, each citizen would have his material sustenance assured. This ought to be proved, but neither Mr. Bellamy, nor Mr. Wakeman, nor any one of the nationalists, has been able to prove it. National enterprises in any kind of business have heretofore mostly proved failures, and it is a matter of experience that those enterprises prosper best which are carried on by private industry. Co-operation is a good thing, but nationalization is that kind of co-operation which is least desirable.

We have explained our views on Nationalism in Nos. 141 and 144 in the articles "Co-operation and Competition" and "Correct Premises but Wrong Conclusions"; both were written in answer to essays and comments that appeared simultaneously in *The Open Court*. Mr. Wakeman in his present article, "Is Nationalism a Sin against Liberty?" does not refute the arguments presented against Nationalism in these previous numbers of *The Open Court*. His idea that society is an organism cannot be disputed and has been vigorously maintained by us also. The idea that competition ought to be banished rests upon a misconception of competition. Competition is identical with liberty and comprehends the right of everybody to do better, if he can, in a certain line of industry than his fellow men. It is the creed of Homer to aspire for being the best of all.

αἰὲν ἀρστέειν καὶ βεῖροτρον ἔμμεναι ἄλλων.—IL. VI. 208.

[Ever the foremost to be and e'er to excel before others.]

I advise every nationalist to try for some time life under the paternal government of Prussia. The Prussian commonwealth is the best realization of a moderate nationalism. The honesty of the hereditary Working Master General, called King of Prussia, and of late promoted German Emperor, stands undoubtedly above the suspicion of bribery; and although he may make and does make mistakes, he has the best intentions to do his duty in the interest of his citizens. The moderate nationalism of the Prussian government is possible only because Prussia is a monarchy, and because the Prussian monarchs obey the maxim of Frederick the Great, that "the King is the first servant of the state."

The consequence of the moderate nationalism of Prussia is, that, to the extent it is introduced, liberty is curtailed and the citizens have become so accustomed to being ruled and taken care of, that many of them cannot endure the bracing air of freedom. They will go to the wall like a bird hatched and raised in a cage, that has escaped from captivity.

Nationalism, I repeat, is as much an extreme as is Anarchism. The best way is the golden mean between both. The truth that is contained in Nationalism as well as Anarchism is the aspiration to improve the social condition of mankind.

Our constitution contains a passage "that the pursuit of happiness" is an inalienable right of man. Does this passage mean that everybody has an inalienable right to be a pleasure seeker? My

interpretation of this passage is, that everybody has an inalienable right to improve the conditions of his life, especially the social conditions of his existence. In this aspiration *The Open Court* concurs with every one who cherishes the ideal of social progress whether he be an anarchist, or a nationalist, or neither. Yet the condition of progress, of improvement, and of a melioration of social conditions is, that we understand the laws of social life. Mere good intentions are of no avail, and schemes of improvement based upon errors will rather impede than enhance progress. P. C.

CORRESPONDENCE.

SOCIAL FACTORS IN THE STRUGGLE FOR EXISTENCE.

To the Editor of *The Open Court* :—

If, as I believe, human happiness is the prime object of life, the improvement of the condition of society and the introduction of more justice into human relations are the most important of all subjects. And this humane endeavor is the best preparation for the future, whatever that may be.

I see by your reply that you are neither an extreme individualist nor an extreme collectivist, and that you feel confident that there are departments in which each has an advantage over the other. I am also delighted to find that your mind is in a philosophical receptive attitude. What a pity it is that in nearly all controversies the contestants seem much more anxious to prove their original position correct, than to discover where to find the truth.

Before a writer can be of any service to the community he must examine his own mind to see wherein it has been distorted in youth by traditions, myths, and legends, these causing unnatural hopes, fears, and preferences.

On a subject like the future state of society, that is in the realm of the unknown, and has new factors to deal with for which allowances must be made, he must divest himself of all his artificial fears, biases, and preferences, and standing on the frontier of information in that line, he must have an unswerving loyalty to follow the truth wherever she may lead before he can make a valuable inroad into the realm of the unexplored.

As it would be profuseless to talk on the many points on which we agree I will pick up some of the divergences; but before doing so will make a few comments on the material with which we have to deal.

All through the barbarous past and into the dishonest present, the few have robbed the many either by undeceptive force or by deceptive law. There is no doubt that the great mass of the many who have been fleeced would be robbers if they could.

Much of this robbery has been justified to themselves by the feeling of caste and vanity that inspired men to think that some men were born to work and provide for other men.

I fear that the virtue of society cannot be raised much above the average of its constituent parts. Therefore, we sorely need a higher race of men before more just conditions are possible.

It is considered proper and meritorious to make definite and scientific arrangements for the improvement of the lower animals, suppressing evil tendencies and encouraging those that are desirable, with such effect that a little while ago the horses of America were small and vicious, while now they are large, good-tempered and symmetrical.

In the light of science that has so definitely established the potency of the Law of Heredity, it seems hopeless to try to improve society or the race as long as it is not considered a deathblow to the possibility of improving it, to send ministers to sanction the union of habitual criminals.

Spencer says that the greatest need of man is the power of self-restraint.

We know that the lower the specimen, the less of that power he has, and the more likely he is to think that the world owes him a living, whereas it only owes him the power and opportunity to get a living.

This vicious trait (that society has allowed to be perpetuated) is responsible for the large class of habitual criminals, both disreputable and respectable, who (having an opportunity) will not render a service for the income they draw from society.

Lack of self-restraint and carelessness as to consequences, result in this beautiful planet being plentifully covered with their mental and physical abortions. The taxes to provide for the necessary restraint for such organisms, in the shape of locks and safes, policemen and jails, lawyers and court-houses, lunatic and inebriate asylums, are so great that all the surplus earnings of many of the reliable people are taken from them.

This enforced poverty makes them fear that they will not be able to provide for and educate a family as they ought to be; hence they forego the pleasure of a home. Good children are not permitted to come on earth because perverted sympathy has only room for the vicious people, as nine-tenths of what they are going to be at birth. And if they were born honest, truthful, and good reasoners, there would be no need of any of these very costly restraints, or even armies or navies.

I do not wish to appear excited, but when a person realizes that the fruits of the labor of the noble and industrious are spent for the purpose of raising and restraining the progeny of the vicious, leaving the salt of the earth so poor that they cannot afford to have good children of their own, then I feel that it is almost time to speak out plainly because the improvement of society is impossible unless we do so.

It is well known that a vicious mental attribute can be handed down as completely as a physical form, and for the community to be so insane as to allow the "habitual criminal" the privilege of doing this through the law of heredity, is not only to bar evolution, but it means the extinction of the good. To this society must turn its attention or retrograde.

As a rule opponents in controversy are not afflicted with an irrepressible longing to compliment each other, yet your magnanimity covertly made you pay me a scientific one. In refutation of my article that "conditions made the villain the fittest to survive," thus you kindly put it: "If Mr. Orchardson's views were true 'that virtue becomes rudimentary' humanity ought to degenerate from age to age and the accumulated result of natural selection ought to be a race of bottled scoundrels. Did not Mr. Orchardson with all his benevolent intentions for the human race survive also? or does he consider himself a remnant of paradisiacal virtue."

Now I don't think that I am a proper subject for a harp and wings. Nevertheless I would raise my eyebrows in astonishment to find myself in jail, and there are many who are astonished when they are out of it. They have sons, I have none. My longing to be slightly instrumental in leaving more justice on the face of the earth, has made the conservative wealthy consider me a dangerous disturber of a state of society that is very good to them. I am consequently tabooed in my profession, and although I have sufficient self-restraint to have kept me from ever being intoxicated, or using tobacco, my income has been so curtailed by advocating the unpopular and expressing my sympathy for undeserved woe, that I dare not enter into relations that might bring expenses I might not be able to meet. You will admit that if my conscience were so elastic as to think that I was smart if I succeeded in making others support my progeny, I would be more fit and likely to survive.

No! dear Sir, you are in a good position to suggest scientific means to bring a higher community that would make more just societary conditions practical. But there are other influences

besides the law of heredity that tend to make men bad, and one of these is that private and public interests conflict. You say: "The government may be able to carry the mails, but it cannot build a post-office that will last ten years."

Now the Government has no building department, and the average private contractor feels that he is committing a meritorious act when he corrupts the servants of the public with a view to swindle the Government. Our present court house was built by private contract, but the city hall was built by the Municipal Government—a far better building at nearly a million and a half less cost. If the city did all its own work, adding gas, telephone, street car, etc., and had no franchises to sell, the private corporations, who corrupt the aldermen to get these privileges, would have no incentive to do so. The aldermen having no franchises to dispense could not afford to bribe the voter, and corruption would mainly cease. In your just rebuke of the insanity of anarchy, you say, "Society is an organized whole." "Would it not be more correct to say that it is only partly organized; abject poverty is impossible only amongst those who are included in the organization. You seem to be under the impression that personal liberty would be gone if society were completely organized.

If the postal service required 1000 men there would be ten thousand applicants. They are no more slaves than if working for private bosses, their income is more secure, and if all other lines were organized and did not conflict, the hours might easily be reduced one half, and the income increased. But I have been diverging so much that I must conclude, although there are many things I would like to say.

C. ORCHARDSON.

INDIVIDUALISM AND PESSIMISM.

To the Editor of The Open Court:—

READERS of *The Open Court* are unquestionably familiar with the truth that Pessimism is rapidly gaining upon Optimism. I propose to defend the highly paradoxical thesis that the tendency can only be reversed by the same reasonings which, in social philosophy lead to Anarchism; and in so doing, it will be my policy to avoid everything abstruse, and to argue from the simplest physical postulates. I assume only that motion follows the line of least resistance. From this familiar law we may immediately infer that every action of an animal (and man is an animal) must, under all the conditions, be the easiest practicable. A puppy frisks about because the motion generated in his nerve centres by the vital forces, finds less resistance in the muscles of his legs than in those imperfectly developed ganglia which he would employ if he resolved, in obedience to his master, to sit still: and if he is tied up, he awakes the neighbors with lugubrious mulations because his lungs supply the readiest outlet to the same irrepressible motion under the altered circumstances. Philosophers have not sufficiently considered these spontaneous actions. It is their restless urgency which makes liberty so sweet; it is the labor involved in their suppression which underlies the only rational theory of morality. For, if we assume with the utilitarian that the end of all action is to secure pleasure or avoid pain, we are at once confronted with some very inconvenient facts. Is it not much like a *reductio ad absurdum* to say that an obstinate slave who lets himself be flogged to death rather than beg pardon of his master, is seeking pleasure or avoiding pain? Or is it any better to make the same assertion of a drunkard who well knows that persistency in his vice will give him much more pain than pleasure? Ask the drunkard why he drinks; and he will tell you he cannot help it—an exaggerated statement, doubtless, but a statement of the great physical truth that to abstain has become, not so much painful, as exceedingly difficult; and that he drinks because the line of least resistance is determined by the organic structure of these ganglia exercised in and developed by the indulgence of his habit. For the utilitarian

postulate that all men consult their interests, let us then substitute the proposition that all men, when not prevented, do as they like; and the principles of Anarchism at once follow. For now we must infer that that system only can be permanent which reduces restraint to a minimum. And the minimum of restraint is clearly zero. The true Anarchist is Shelley's "man of virtuous soul." He "commands not nor obeys." He proposes to do what he wishes, regardless of authority. He would hinder no other man from following his own devices. But he reserves two privileges—to attempt changing the disposition of others by persuasion, and to sympathize, when he sees a fight, with the aggrieved against the aggressor.

The connection of these reflections with that tremendous Doubt which Schopenhauer made familiar to the western world is this—there is in Optimism and Pessimism a common assumption, which is precisely what we have been criticizing. Both assume that men's actions are necessarily determined by the love of something—"Happiness—pleasure, ease, content, whatever the name," and the dread of its opposite. A person who knows what immense influence both these systems have exerted, may however, well suspect that neither is more than a half-truth. Have we not, by a wholly independent process, discovered the common assumption to be what makes two falsities out of two verities, and causes them to exclude each other, which without it they would not; just as the Knights in the fable need never have quarreled if they had not both taken for granted that the shield was of one metal all through? The philosophic Anarchist denies this assumption. He holds it to be a defective generalization. Men's conscious and voluntary actions commonly, though not always, do aim at securing pleasure and avoiding pain; but all their actions, voluntary or otherwise, are determined by the wider law of motion. This theory harmonizes with fact. It resuscitates hope, which is always the spirit of the optimist. With elaborate constructiveness, piling story upon story, adding avenue to avenue like some genie architect of sepulchral gloom, Pessimism demonstrates that the systematic pursuit of happiness, in whatever direction, leads to labyrinths where men lose themselves, and where snares, pits, and lurking lions lie in wait to devour. But the whole city of despair vanishes at this one disenchanting spell. "Men seek primarily their own way. Happiness is an incident of finding it." It now concerns the magician to construct upon the vacant ground some proof that "the Unconscious" has set bounds against the successful pursuit of liberty. The Anarchist asserts the contrary. He asserts that progress within the sphere of history consists in the abolition of discordant relations among men—such relations as negro slavery, for example—by the growth of that spirit which "commands not nor obeys." He asserts this observation to be a special case of the greater truth that motion, from its earliest inception in the nebula has, by following the line of least resistance, tended to the establishment of indifferent equilibrium. He sees in absolute freedom the subjective correlative of indifferent equilibrium among social units. He regards dissolution, whether it be seen in a molecule of protoplasm or of inorganic compounds, of an individual organism, which may have been a hero or a sparrow, of a society like the Roman Empire of an orb, like Olber's planet, or even of a system like the solar—motion liberating itself from restraint along the line of least resistance, to reappear in other aggregates which permit a nearer approximation to indifference of equilibrium. Unable, as are other men, to affiliate feeling upon the objective, or mobility upon the inert, he regards all these as inseparable correlatives, and identifies the First Cause with the ideal result. Thus Anarchism is part of a philosophy essentially spiritual. Rejecting the dogmatic conceptions of God and immortality, it rehabilitates under subjective forms the fundamental instincts which have given rise to both. It discovers sensuous gratification by not seeking it. This combination of essential mys-

ticism with formal nihilism is very conspicuous in Bakounine. Amidst "the wreck of matter and the crash of worlds," the philosophy of freedom stands forth as the principle of obedience to eternal law, and demonstrates the immutability of its source.

"In even motion by that love impelled
Which guides in heaven the sun and other stars."

EAU CLAIRE, Wis.

C. L. JAMES.

SEA AND SKY.

BY J. H. TEMPLE.

I. QUERY.

I HEAR the shoreward beat of ocean-waves;
The tide-pulsed waters, river-girt and whetted
To voiceful wrath betwixt their cavern-fretted
And monster-haunted base of buried graves,
And the wildwind-rocked world that never sleeps,
Arouse the list'ning Soul with mighty cry
And wake the bending music of the sky
That stoops and beckons to its spacy deeps
Where night-dim stars and day-efulgent suns
Hide in serene profusion and excess
Of light divine: O, mighty, voiceless ones,
Whose silence speaks in teeming, crowding press
Of boundless Being more sweetly deep than speech.
What lore of life, what wisdom can ye teach?

II. PAIN.

Exquisite solvent of the Gods, and dear,
That gods Man's sluggish nature into Deeds;
The heart is waste, and barren, till it bleeds,
Poor, shrinking Soul, Hope's fruitful half is FEAR!
The fire-embowed Earth in tort career,
Knows all thine inarticulate needs;
Begets and buries Races, nurtures, feeds;
The blood would rot in Pleasure's atmosphere.
Old Chaos' self crept into Beauty's shape
Through feeling SENSE, blind Impulse at the wheel;
To think were devilish severed from to feel.
Man, 'reft of heart, were but a chattering ape!
Wine issues only from the trodden grape,
And iron must be blistered into steel!

III. HOPE.

The World is full of worlds; yet widelier far
Than stretches the horizon east and west,
Vainly my thought pursues its eager quest
Of some wide-wandering world, some happy star
Enfolded in an atmosphere of rest
Where all the essences of Being are,
Where broken, finite life comes not to mar
With strife and wreck the Eden of the Blest.
The heart is full of PAIN; yet deeper down
Than finite life or shoal Volition's reach,
Within the inmost caverns of the Soul,
Beyond all utterance and forms of speech,
Springs Hope, the sceptred Queen, with budding crown.
And promise in these fragments of a Mightier WHOLE.

BOOK REVIEWS.

Les Notions de Force, de Matière, et de l'Esprit, selon la Science Moderne. By Madame Clemence Royer. Printed in the *Bulletin Mensuel d'études philosophiques et sociales*. 174 Boulevard Saint-Germain, Paris.

The Open Court has received several valuable scientific articles and monographs from this well-known French lady, among which we notice an exhaustive essay "On the molecular constitution of

water in its three physical states, and concerning the properties of gases according to a new hypothesis" (*La constitution moléculaire de l'eau sous les trois états physiques, et les propriétés des gazes d'après une nouvelle hypothèse*); and further the above mentioned essay on the notions of force, of matter, and of mind, according to modern science.

Matter and force, says Mme. Royer, are constantly being contrasted, as distinct entities, opposed to a third called *mind*. But ought really matter to be distinguished from force? No. From a purely physical point of view, force can only be conceived as the essential activity of matter. In reality we know nothing about matter, except from this very force by which it reveals itself. Matter of itself, like entity or substratum remains a postulate of reason, just like spirit or soul. Our senses do not directly perceive it. Through the touch we apprehend its force of impenetrability, force of cohesion, weight, or inertia; we realize its resistance to movement, or to the diminution of movement, its tendency to fall vertically, the pressures exerted by its weight, its variations of temperature in relation to our own temperature. Through sight we discern the forms of bodies, namely, the reciprocal limits of heterogeneous masses; the colors of their surface, their different reactions to light; their displacement in space—or, their movements. Through hearing we can only seize vibratory movements. Yet all this is merely the result of the action of forces. Matter itself, the subject and agent of all these phenomena, remains unapproachable, unobservable, unknown even to chemists, who only possess hypothetical, uncertain, incomplete data concerning the nature of matter. Most of them admit, that matter is composed of irreducible elements, called atoms; but their vague notions of atoms do not explain the phenomena. By what right, accordingly, can we presume to separate matter from those forces that alone allow us to realize its existence, to determine its quantity?

By what right can we refuse to matter-substance, of which we know nothing, a certain virtuality, and certain psychical attributes that we only gratuitously suppose to be contradictory to its nature, although these very attributes are only observable in bodies constituted of matter, and never otherwise?—The conception of matter as being distinct from force is in itself entirely contradictory, because it supposes a subject without attribute, an agent without activity, and, on the other hand, an activity without agent, or attribute without subject. This erroneous notion of matter has been simply the result of an abuse of our faculty of abstraction.

Mathematicians, in measuring forces, are compelled to abstract from their agent or substratum, and to regard as inert the agent and subject matter of these forces. From this purely theoretical distinction—only a method of analysis enabling us to study separately different physical phenomena—metaphysicians have inferred the distinction of essences, the plurality of substances, the diversity and contrast of entities. Because force had been severed from matter merely to facilitate the study of force, they concluded, that there must exist a substance of force, and another substance of matter. From the relative inertia of matter, supposed absolute, although but a geometrical abstraction, they made a special unique attribute, by modifying the concept of inertia itself, which really is not, as supposed, a pure passivity of matter, an indifference to movement or to rest, but a genuine resistance to movement.

From this theoretical abstraction of mathematicians operating with forces as with numbers, namely, without concrete entities, scholastic realism attempted to effect the separation of forces from their agent. Where there only existed one substance and diverse phenomena, it created for each phenomenon a separate substance. Not only force in general, but each mode of movement, which it determines, became an entity. Despite Bacon's loud protest against these "phantoms (idola) of the mind," there was created an entity heat, an entity light, an entity electricity.

According to Cartesian dualism matter is not only inert, inactive, absolutely passive in the movement that forces impart to it, but, moreover, matter is regarded as solid, infinitely divisible, essentially and mathematically. It can be ground more or less minutely, as sand or flour, but each of its elements remains conceived with all the attributes of solidity. This conception of substance Descartes held in common with Newton, Epicurus, and Thomas Aquinas; but Descartes forgot, that this concept of matter implied the existence of that vacuum which he denied. In his day Leibnitz was the only one who protested against the passive concept of the atom, giving to it the name of *monad*, yet without hazarding to generalize it, by extending it to the entire cosmic substance, as has been later done by Faraday, by defining the atom as a *centre of forces*.

From the concept of the solid atom, through an erroneous application of the law of proportionality of weights to masses, established by Newton, our modern physicists still hold to the proportionality of masses to their extension, and consequently, the absolutely equal density of atoms. Newton, in his letters to Leibnitz and to Clarke, and in his *Principia* repeatedly protested against the narrow, literal interpretation, which in his own day his disciples gave to the term *attraction*, which to himself was only a metaphor to designate the unknown force that draws bodies toward each other, directly as their mass, and inversely as the squares of their distances.

But why do we imagine the first elements of matter always with the exclusive attributes of solidity, with the absolute properties of the supposed mass of mechanics? Simply because it is only in the solid form that primitive humanity and children first experience the existence of matter, its impenetrability and weight. During many years the child is unable to conceive its existence otherwise, and during millions of centuries humanity was ignorant of the fact that matter could have other attributes or properties than those of solids and liquids. The discovery of the weight of the air, and our more precise notions of gases are altogether modern inventions. To the ancients the air was almost immaterial, a breath, *pneuma*, or *ψυχή*, the soul, which according to Homer left the body with the blood. To the ancient dualists matter was solid and heavy, but spirit fluid, ethereal, "tending upwards," as they said, in contrast to what had the tendency to fall downwards. Their concept of spirit was identical with that, which they formed of gases and vapors, which modern science, on the contrary, regards just as material as the heaviest bodies, and even endowed with much greater physical activity and dynamic energy.

The moderns, in order to distinguish spirit from matter, to spiritualize it still more, have made it a substance without weight, and even without extension: a nothing of substance, an abstraction like the geometrical point. By dint of subtilizing spiritual substance, it has been reduced to an unintelligible nullity, which itself devoid of extension cannot act upon extended matter. On the other hand, to our modern chemists matter has become more and more diluted and attenuated, incessantly tending towards dispersion in space, as if the state of fluidity were only natural to it, and the solid state a constraint, an incumbrance. But this tendency to dispersion, as now verified in all bodies, even the heaviest, is in flagrant contradiction with the concept of attraction, and with that of solidity and inertia. Thus, in modern science, matter tends to usurp the place occupied by spirit in the science of the ancients; and spirit, through a series of abstractions is reduced to a substantial nothing. To the moderns, spirit is only intelligence, understanding, namely an attribute, a faculty; it has ceased to be an entity, a substance. Living organisms can perform all their functions without it, and without spirit in any manner interfering with any of their spontaneous or reflex acts, especially those that are indispensable to their preservation. But to science matter is no longer inert; in the universe there is no entity beside matter: matter

alone is substance, and comprises the entire substance of the world. The elements are uncreatable and indestructible. The unity and identity of physical force is the great discovery of the present age, that will transform science. By virtue of this unique, protean force, all substantial elements, whether material or ponderable, ethereal or imponderable, reciprocally move and limit each other, so that all their movements of mass in reality are spontaneous and exclusively due to their own activities that differ only by measure or intensity but not by essence or quality; that is to say, in the world there only exist between the different individual elements constituting bodies, apparent differences of quality, that in reality are differences of quantity.

But the first elements of being—the atoms—are distinct individualities. Each of them is a living ego, conscious of its actions and reactions, endowed with the passive, yet more or less intense, sensation of the varying limitations to which it is subject from the pressures of all its neighbours and from the movements which it spontaneously accomplishes while reacting against them in order to defend its own share or part in space. In other words, every cosmic substance is at the same time living, conscious, thinking, and capable of willing according to perceived motives that determine its movements, which are acts. The whole substantial element of the world is thus at the same time *matter, force, and spirit*; spirit and force being only the two essential attributes of the single entity that we call matter when ponderable, and ether when it is imponderable.

Such is Madame Royer's theory.

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MONISM OR ADVAITISM? An Introduction to the Advaita Philosophy Read by the Light of Modern Science. By *Manilal Nabhubhai Divedi*, Professor of Sanskrit, Samaldás College, Bhavnagar. Subodha-Prakash Press. Bombay: 1889.

It seems as if modern European science, in developing the theory of evolution, had made the Hindu philosopher for the first time really *conscious* of the true tendencies of several of his own systems, particularly of the Advaita-system—signifying the religion of non-duality. The indefinite vastness of all Hindu philosophical categories has caused them to be regarded as arbitrary phantastic hypotheses; and yet, probably by virtue of their transcendental comprehensiveness, several of these systems, as the *Advaita*, had already in ages past fully grasped the principles of evolution, although only imperfectly carrying them to their scientific and logical conclusions.

The learned Professor Divedi of Samalda College, Bombay, also seems to admit that the principles of Advaita philosophy find a very convenient expression in the principles of European monism.

This little work does not enter into a critical investigation of monism, but merely points out the striking analogies existing between both systems, without implying that the two are exactly equivalent systems. In the present case, indeed, any too close or exaggerated analogies would fail to do strict justice to either system. There is however a dangerous approach to vague comparisons in several passages of the author's work, as when he (on page 98) asserts, that "Advaitism extends the principle which monism applies on a smaller scale"; or that, "Advaitism analyses all organisms into their constituents"; or that "both monism and Advaitism are true advocates of development in its widest sense." After all, the most difficult, and at the same time, the most important task, that any philosopher could undertake, would seem to be that of pointing out the radical *differences* existing between European monism and the Advaita philosophy of the Hindus. Monism, with its indispensable foundations of empirical facts, is nevertheless not a disorderly heap of stones, nor are the transcendental foundations of the Advaita structure, which dates back through unold centuries. At that early date, however, it was not as yet a perfectly conscious Advaita-religion, a religion and philosophy of non-

duality. To attain to this clear conception of non-duality, it still needs the collateral support of a strictly scientific, European, monism.

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NUOVA CHIAVE DEI SUONI DELLA PRONUNZIA INGLESE. Compilata secondo i più recenti portati della Fonetologia di quella Lingua, e diligentemente comparata per uso degli Italiani. By *Raffaele Quattrocchi*, Professore dei R R Istituti Tecnici, etc., etc. Oxford: University Press.

Professor *Quattrocchi*, who is also the author of a *Trattato completo della pronunzia Inglese* (Napoli, 1886), maintains in principle, that the difficulty experienced by Italians in acquiring a correct English pronunciation will only be overcome by their contracting the habit of carefully vocalizing according to the English fashion, by means of the vocalic restriction characteristic of the latter language, and which is obtained by displacing the guttural basis of the Italian vowels, and changing it for the palatal one of the English vowels.

In his "Nuova Chiave etc." Prof. Quattrocchi carefully illustrates this phonological process in a table of comparative examples of English and Italian sounds. The English consonants *b, d, f, k, l, m, n, p, q, r, s, t, v*, are sounded as in Italian. For the remaining English consonants and double consonants, and for the vowels, he then presents the well-known conventional symbols, adopted by the English phonologists Murray, Sweet, and Skeat, and the equivalent Italian sounds according to accepted Italian glottology.

Prof. Quattrocchi's scholarly treatment of this delicate and irksome subject of comparative Anglo-Italian articulation will be found a material improvement upon the approximate method of the old English-Italian grammars, like that of Millhouse and others, for example, and deserves to be strongly recommended to all Italian students of the English language.

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The contents of the *July Cosmopolitan* well harmonize with the season; fiction and the description of out-of-door sports predominating.

"Our Destiny" in the *July Nationalist* is a continuation of Mr. Laurence Gronlund's descriptive series upon the evils of the present régime, and their remedy under the nationalistic form of government.

We have received from N. D. Hodges, of New York, 47 Lafayette Place, a little cloth-bound pamphlet of sixty-seven pages, entitled "Protoplasm and Life," by Charles F. Cox, late president of the New York Microscopical Society. Mr. Cox reviews the history of his subject with knowledge and skill. He leans to the opinion that living substance could never have been derived from "lifeless" substance, and his conclusion is that the general theory of evolution is still in the stage of *hypothesis*. (Price 75 cents.)

Prof. John Tyndall contributes an entertaining sketch to this month's *Forum* on the influences that have shaped his life; the article is pleasantly written and tells of many famous men.

In the *Atlantic Monthly* for July we find an article by N. S. Shaler on "Science and the African Problem." The author proposes the organization of a society, for the settlement of the Negro Problem. He says: "The African and European races must remain distinct in blood, and at the same time they must, if possible, be kept from becoming separate castes; there must be a perfect civil union without a perfect social accord; they must both march forward with entire equality of privilege as far as the state is concerned, yet without the bond of kinship in blood to unite them in the work of life,—indeed, with a sense that it is their duty to remain apart." We must refer the reader to the article itself for the details of the work of the organization proposed.