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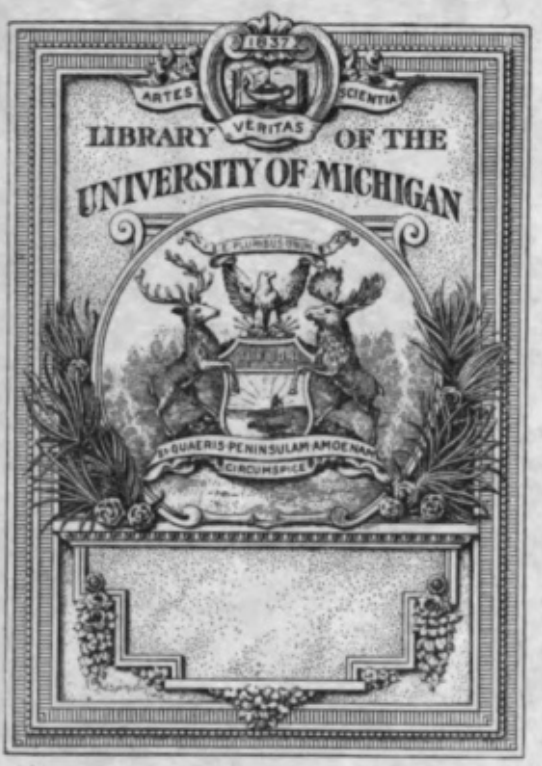

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"Quantam ego quidem video motus morbosi fere omnes a motibus in systemate nervorum ita pendent ut morbi fere omnes quodammodo Nervosi dici queant."—CULLEN'S NOSOLOGY: BOOK II, P. 181—EDINBURG ED., 1780.

THE

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A JOURNAL OF

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Intended Especially to Subserve the Wants of the General Practitioner of Medicine.

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THE
ALIENIST AND NEUROLOGIST

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SOME PSYCHOLOGICAL STUDIES OF MAN'S MORAL EVOLUTION.

By ALBERT S. ASHMEAD, M. D.,
NEW YORK.

I.

THE MYSTERY OF OUR KNOWLEDGE OF GOOD AND EVIL—ITS ZENITH AND ITS NADIR.*

THE occult power of evil is remembered also in an incident I have before related, of the breaking of a goblet by a little black imp, seen only by the mother of an absent child. This mother was lying on her couch and the goblet was upon a table. She saw the black elf, standing on the table beside the goblet, raise a hammer as if to strike the goblet rim. She cried out, "He is going to break it;" "He will break it;" "He has broken it." And it fell in a thousand pieces to the floor.

At that very moment the breath of her dearly beloved child had left its body, in a distant city.

I recall also the story of the voice which a gentleman heard, who was traveling eastward from San Francisco. It commanded him to "Go back." Finally by its persisting, on going to the baggage car, at some stopping station, where he had determined to obey the strange command, and

*Continued from November, 1906.

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where he supposed he would meet with much trouble to find his trunk among the multitudinous baggage, he found the baggage car door open and the baggage master with his identical trunk awaiting him. The baggage man stood there, with his hand resting on his trunk ready to pass it out to him. Upon his return to San Francisco, by the back bound train which passed the station where he got off a few minutes after he had left the east bound train, he found his old father breathing his last. He lived but two hours after his son's return.

"Ah!" says the Fatalist or the Occultist, "I have neither faith nor reverence. There is no Free-will. We are all helpless." It is worthy of note here that the advance of human insight into natural law is accompanied by the cast of thought indicated by the Buddhist's belief in Nirvana.

The occult must be approached by the path of Reason.

All that happened to Dr. Love for instance, is happening daily to everybody. On the doctrine of chances, could there have been a concentration upon his family? or, was there a Direction, an Intention?

Another case, that of a Dr. Patterson, is likewise here pertinent, and directly in line with the theory of involuntarism; and the review of this case by the alienist, Dr. McGuire, shows in mentality, all the mind phenomena; the same simulation, dissimulation, and later determination, that Nature exhibits in bodily ills that our medical profession devotes itself to studying. Dr. Patterson, of Colorado, gloried in his criminality. "When a child," he says, "I felt the influence of heredity, felt that I was born to be a thief." "It is necessary," he says further, "for society to protect itself against men of my class."

I agree with him, and I also believe that he states the truth as to his feelings. Society must protect itself against lunatics, without conscience and without remorse. But are these beings really lunatics because evil, as we know it, has obtained possession of their bodies, brains and other cells?

For years a careful student of criminology, taking the deepest interest in the study, because he recognized in himself the proof of the theory that a criminal is what he

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.s because he is born with instincts, the development of which neither environment, fear of punishment, social ostracism nor anything else can prevent, this Dr. Patterson, now confined in a cell in the jail at Denver, was arrested on a charge of forgery. In his early years he fought against his inherent desire to take what belonged to his fellow man, because of the disgrace that he feared his father, mother, and other loved ones would suffer from his actions, and for the sake of his wife and children, he continued to wage the unequal battle. It was heredity versus environment, he declares, and heredity won.

This is the excuse he gives for his present condition. From a man of prominence and an heir to great wealth, the police found that his fall was so complete that he was living in the most abject poverty in a dingy room in the lowest quarter of the city.

"My one great regret in life," he says, "is that I have fallen a slave to the morphine habit and, unable to resist its use, have failed in my ambition to become the greatest criminal of the age."

"I glory in crime and am a criminal because it is impossible for me to be anything else. I have tried and failed, and am glad of it. The fight was unequal at best, and I am glad that I finally started out in a career of crime and that I have committed thefts and burglaries, have stolen into houses at night time and taken property that belonged to others, for the pure love of it.

"I did not need the money, did not want the booty that I took away after I got it, but there was a satisfaction too deep for words, too self-satisfying for explanation. I imagine that a woman who has held her lover at arm's length and perhaps for the best of reasons, has refused to surrender to him for a long time, must feel much as I did when I committed my first theft. It was not much, too little a thing to notice, yet it was the beginning of a career that I mapped out for myself after I fully realized that there was nothing in the world that could prevent my being anything but a thief. I was in a fellow physician's office and I saw a pocket book lying on the table. He was

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busy with a patient and I opened the wallet and found two dollars in it. I then had plenty of money and the contents of the purse could do me little good, but resist the desire to take the money I could not and did not. I knew that the high character I bore would protect me from the possibility of exposure, and the cunning, which I have since learned and which I use to protect me from being found out when I succumbed to my desire to take possession of that which does not belong to me, was not necessary in that case. That was years ago, how many I do not know. It was the beginning.

"My father and mother were of the highest character. The desire which impelled me to take the marbles of other little boys, to filch the pockets of my school-mates, when their coats hung in the coat-room, came from further back than my immediate ancestors, just as the genius of a great painter, or that of a great writer or poet, is inherited from ancestors further back than can be remembered. The desire to commit crime is similar to the desire of a genius to develop the talents which are his. It is often the strongest passion of his life and for which he will give up every thing else, just as an artist will struggle along for years, going without the necessities that he might have in some other walk of life, that he may develop the talent which he feels within himself.

"Born a criminal and forced by a power which cannot be understood to commit crime, I am no more responsible for what I am than are any of the geniuses of the age for what they are. The world honors these men and gives them credit for the work they do because it adds to the world's store of knowledge, but the men who do great things do not do them because they wish to add to the comfort and enjoyment of their fellowman, but because they can do nothing else. They have to do these things because they are made to do them. They do not deserve credit for what they accomplish, and a thief does not deserve censure for the harm he does to society. We can do nothing else. It is a part of him, of his very nature, to steal.

"It is as impossible for me to lead an honest life as it

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is for some other men to become criminals. The criminal instinct, however, is more common than the instinct or desire to accomplish great things for the world's good. All criminals are not alike and all are not affected by the same impelling force. Some are murderers and cut-throats, others are sneak thieves and porch climbers, and then there are men and women, too, who take the greatest satisfaction in robbing the less wary by their greater wit and cleverness. No class of mechanics take greater pride in their work than first-class cracksmen, who overcome the thousands of obstacles put in their way when they wish to open a vault. So marvelously skillful are many of these men that if they used the same energy and talent at honest employment they would be great inventors and would receive money and fame for what they accomplished, instead of being social outcasts and always in danger of a policeman's bullet, or of a jail sentence. The risks they take in comparison to the rewards of their work are so great that, considered from a practical standpoint, the business does not pay.

"Doubtless there are many robbers and thieves made so by necessity, but such men never become experts, and when the opportunity offers go back into legitimate lines of work if not captured by the police. Some among them have the criminal instinct in a degree, and when necessity compels them for the first time to commit a crime, it awakens the heretofore dormant instinct in them, and from that time on they are confirmed enemies of society."

The questions connected with the case here cited, which criminologists are most deeply interested in are these: Did Dr. Patterson's constant association with criminals, his deep interest in their lives and the trend of their thoughts wear down his powers of resistance? Did the use of morphine during the later years of his life warp his mentality and blunt his perceptions?

Were his criminal acts the result of rapidly approaching senility or, were they the result of congenital inheritance as claimed by him?

In answer to a hypothetical question Dr. Frank McGuire, one of the best known alienists and criminologists,

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said: "It is held by a number of celebrated alienists that the moral and intellectual spheres of thought are separate and distinct. I cannot think so. I do not believe that you can have the moral sphere seriously involved without involving to a certain degree the intellectual sphere. They may not be closely linked, but there is a certain connection between them.

"The instinctive moral sentiment of a person will often rise above adverse environments. Children, when young, will show the moral sphere instinctively. Place many men in bad surroundings and they will still be moral. Take a man whose morals are blunted, for instance——his intellect may be above the ordinary, but he may be a criminal from acquired habit.

"The man referred to in this question, Dr. Patterson, is evidently a congenital criminal with a high grade of intellectuality, with which he covered up his crimes. This intellect led him to be careful. It placed him in a position which made his crimes safer and made him a much more dangerous man. He concealed his congenital moral defect under the garb of eminent respectability, because he had intellect enough to carry out the deception along that line.

"That he was a forger was most natural. The more intellect a criminal posseses the higher the class of crime he will engage in. The only inconsistent thing about this case is the fact that the man committed burglary. This crime belongs naturally to a lower grade of intellect. It requires brute courage. Forgery or embezzlement, or high class sneak thievery would be more in line with his intellect.

"Certainly morphine may have had something to do with it. Again it sometimes happens that there is evidence of moral defects in senility.

"The man's instructive nature evidently exercised a considerably greater influence upon his actions than did his intellectual nature. The defect of his moral sentiment might have been the result of defective organization, as he claims.

"The instructive moral sentiment as a rule rises above defective environment although the moral attibutes of the mind are equally as transmissible as the physical.

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"Criminals, as a whole, may be divided into four classes as follows:

First—Criminals whose moral sentiment is absent, or slightly developed and the intellect poor. These may be called born delinquents.

Second—The insane delinquents whose moral sentiment is absent and the intellect so far developed as to be above the ordinary. Included in this class are congenital criminals and criminals from acquired habit. The criminal Patterson is probably of this class.

Third—The moral sentiment is developed and guides the ordinary condition of the individual, but has feeble powers of resistance. The mind is influenced by emotions. These are passional delinquents.

Fourth—The moral is more or less developed, but becomes perverted by a mental defect, epilepsy or alcoholism, the diseased brain giving new factors influencing the conduct of the individual in his relation to society.

"You may find all criminals under one or the other of these classifications, and I am pretty sure that the man we are speaking of comes under the second head. He resisted crime so long because his instructive sphere was stronger than his inherited tendencies.

"Amputation of criminals' brains? Oh, no! Not until they begin to come into the world with a tag on each convolution of the brain telling just what it is for."

Dr. McGuire's closing remark on brain amputation is, to my understanding, an expression that Nature (or God) is properly presented by the story of Eden, a heartless malefactor, whose evil work Physicians and Pulpits have ever tried to undo. Vain labor! Individuals are comforted by them. But always a throng toward a Mecca.

Faith is an utility, not an evidence—a mixture nine parts Resignation, one part Hope.

It is a matter of Temperament and not of Will. Many appear to have faith, who have it not—it is with such a business asset.

Ingersoll has said: "No man has gone beyond the hor-

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izon of the Natural. I do not know whether the grave is a door or a wall."

Youth is the only period when we bound over rough waters; as the age of 60 approaches, or is reached, a malignity and persistence appears which is disastrous, though it may not be any more serious or portentous than the stumbling blocks of the earlier decades of life. All the day, like a cataractous one, we look through a fog. Yet we walk along freely using no more care than is required of the life pedestrian usually. But when the night time comes, we see more clearly, and do not feel that we have eyes. We are indifferent. Faith perhaps we have not. Resignation we possess, certain of a fixed and active principle of Evil to Nature, to which each being is to some degree and from time to time, a victim; the world has no more interest for us—it is the daily Eden and the creeping Serpent, with the Master looking on.

Aided by the cool foggy air of late life, and the gray dawn of the approaching day, we may read the most interesting revelations like that of immorality in Japanese life, (which I published in the Journal of Dermatology, July, 1906.)

Only the more hopeless does it cause to appear the plan of the Natual Law.

The two human civilizations, Occidental and Oriental, are now inpinging each upon the other—in obedience to the great principle of dissemination, the indiscriminate dissemination everywhere seen.

The plan of the union of the White races against the Yellow as suggested by the paper of Mr. Stein, of our department of Commerce and Labor (Pan-Arya) would certainly introduce among Occidentals the most dreaded feature of Oriental life. The military success of Japan in the late war will be used to show that there is no God, or no Christian God, and that immorality has not weakened a people—no thought being bestowed upon the fact of Negro and Malay parent stock, the great animal base of the present human pyramid being there seen.

In striking (and strange) contrast to the evil side of Oriental character I quote here a lyric and an extract from

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Lafcadio Hearn's latest work. They are so beautiful (no matter what their source) that I have selected them for the comparison:—

JAPANESE LYRIC.

My little bird,
My bird born in my mother's tears,
She flies, stretching her wings so,
And from under her wings she drops my mother's message:—
"Come home, Beloved!"

Running out from my mother's bosom my little river,
She suddenly stopped her song
And looking up to the sun,
She in her ripples flashed my mother's message:—
"Come home, Beloved!"

My roses,
My little roses grow in my mother's breath;
They are sad today,
Casting their faces down,
In their petals I read my mother's message:—
"Come home, Beloved!"

(Youe Noguchi, in National Magazine.)

In his book "Kotoro," in the chapter entitled "After the War," Lafcadio Hearn, who was present at the return of the victorious troops at the close of the war (the Chinese-Japanese War) said to his old servant Manvenon:

"Today you will be in Osaka and Nagoya. You will hear the bugle call and with its appeal you will think of your poor comrades who shall never again see home."

The old man replied with quiet earnestness:

"The people of the West believe, perhaps, that the dead never return. But we think otherwise: the Japanese dead all return, they know the way. From China and from Choisu they will come, and those who rest on the bottom of the sea, they all turn back—all. And when the darkness comes they will assemble together and impatiently await the signal call."

In our last analysis of the Visible we see it is the Beauty and the Beast that has passed before us on the Rialto of life. That which the Great Playwright hath wrought the actors must do—their parts in life are not of their seek-

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ing and they cannot escape that from which they would later flee.

Mr. Layton Crippen, a recent reviewer of Mr. Hight's book "The Unity of the Will,"* makes himself more conspicuous than the book, that he leads the reader to expect would be presented. If I correctly apprehend the so-called review, the reviewer hides his incompetency under a garb of flippancy. Mr. Crippen is the author of "Olympus, and Fuji-Yami" (the Japanese Holy Mountain). He calls his review of Mr. Hight's work "The Mystery of the Human Will."

Mr. Hight takes it for granted that the Will is the primary reality; that the intellect is its instrument, and he gives credit to Schopenhauer for being the first philosopher to make this plain. Surely one can object to this contention. Schopenhauer's philosophy was that of Buddha, it was that of Paracelsus, it was that of Jacob Boehme, it was that of the Oriental and Occidental mystics for thousands of years. "For God is but a great will pervading all things by nature of its intentness"—it is not necessary to say whence that quotation is taken.

The sense of the Will inspired the greatest poets of the world; they, like Mr. Hight, feel that "all creation is permeated through and through and animated by an all-ruling Will, which is eternally striving to actualize itself in phenomenal life." This is Mr. Hight's central thought, and his argument is carried forward with a directness, a logic, a careful avoidance of unnecessary technicalities that are admirable. When it is said that on reading the work one fails to find a page that is superfluous it will be evident that even to give a bare outline of the thought in a brief review would be impossible. Here are one or two sentences from the chapter that takes its title from the title of the book, which will give some help to a realization of the idea:

"A miraculous force is seen welling up from the depths of nature, shaping, adjusting, creating; whether we call it "vital force" or "psychical law" matters very little; that

*The Unity of the Will. Studies of an Irrationalist. By George Ainslie Hight. New York: E. P. Dutton & Co. $8.

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depends upon our own individual standpoint, but the important thing is that it is one, and is tending to one end through all the varied means, through adaptation, strife, failure, better adjustment, and final survival of the fittest; often failing and again beginning with renewed effort till the end is gained. No one can see the will; but what if does we see, and if it cease the action also will cease. Our consciousness, the onlooker, shows it as a judge, or referee, allowing or disallowing, but taking no part in the action, only using physical causality as the instrument of its projection into objectivity. Every action is possible to the will; it is all-creative; as every pattern is possible to the lacemaker sitting with her bobbins before her, and weaving, by simple movement of one thread and another, just that web which she desires; as all literature is open to the typewriter, who produces the sentences he wishes for by touching the levers in turn, never breaking the causal sequence, but simply pressing or abstaining. Thus do the varied causal actions of the Universe lie ready before the will to allow or disallow as it pleases; the levers are in position, and as it presses with the mechanism of a human brain now one and then another of them, as it reacts mechanically to an impression, or lays it by for the future, furnishes or withholds a supply to meet a demand, so it brings forth the harmony of active life. For that harmony which enables each thing to fulfill its functions among others around it, which makes it appear as if designed to fulfill a purpose, that, and not the material composition of its substance, is its true being."

Such, briefly and quite inadequately suggested in this review, is the main idea of Mr. Hight's book. But there is another purpose in the work—a purpose to which the development of this main idea is perhaps only incidental in the author's mind. "The Unity of Will" is a bitter, powerful attack on modern science. In grave words, Mr. Hight warns civilization of the peril, which in his opinion, threatens it:

"Science now assumes the control of civilization, as once did theology, and its career will be the same. Will any

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one deny that rationalist science commits the sophistry of seeking to prove and disprove by words alone things for which no data exist, that it assumes artificial concepts of things unknown, or that logical theory in upholding the supremacy of reason abets it therein? A glance at any academical journal will show what our universities understand by knowledge. Questions are discussed which never can be answered; views expanded which never can be tested, because they deal with things long passed away and unverifiable; "authority" means the opinion of one who has read most of the opinions of others, and this is called erudition. * * *

"It will doubtless be urged that there is nothing in modern science to contradict the existence of an unseen world; the evidence for it has often been dwelt upon by scientific writers themselves. Only the two worlds are separate; science merely regards the one as lying beyond her sphere, because to confuse the two would hinder her own special work. "What can be more innocent than agnosticism?" says the follower of science: "I do not choose to say that I know what I do not know." It is not the modest confession of ignorance that one wishes to find fault with, but the aggressive, intolerant attitude which science adopts towards those who go elsewhere than to her for inspiration; who choose other methods than those which she prescribes; her aggressive controversies, made to rest upon words for things which do not exist, such as the word miracle. If to think that what is wonderful must be the work of God be a thing so dreadful that the whole artillery of science must be brought to destroy it, then Heaven help us, for we all think it!"

I do not understand that the author considers the "Mystery of the Human Will," but, rather the question, whether there is to be seen evidence of the Supreme Will of an Intelligent Designer; who has ordained and instituted a Plan and left the details of the operation, indifferent towards the fates of individuals—in which case there exists no mystery of the human will—for human will does not exist.

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My view of the Plan is quite definite, and, I believe, consistent in all its parts.

It has come to be admitted that Nature is Energy. But energy and force are confusedly used. Let me present the following: Force is localized Energy. Under that formula, Unity is seen. The diffused heat and light of the sun is localized as to results of animate and still life on earth according to soil, latitude, altitude. It is the Plan with which we come in contact; the Plan that we can in a small degree, as to its relation to our daily fortunes, get a glimpse of. But its Creator we are not permitted to approach. Before the Great Unknown we can only grovel and cry: O, God where art thou! Why go so far afield? We are not wanted there until the ultimate is reached. Looking and longing we are no more advanced in the knowledge of God than isthe dullest or the wickedest savage. All that is refined and pleasant in this communal life of men has been wrested from the brutality of nature in the efforts of man to construct ethics and codes for the protection of himself and his posterity. Let man apply himself to *work*, and pass theory.

To some extent (perhaps wholly) I continue the thoughts dimly expressed, evoked by the "review" or notice of Dr. Hight's book "Unity of the Will."

It is the "work" of the world in which each human atom is individually engaged without the slightest will of his or her own. It is the evidence of involuntary "Natural Selection." To me (if I may not be deemed as making myself too prominent) has come the joy of unmasking (from my experience) the duplicity of the Divine Order of things. To me it is in addition to the humanity of my profession, its solaces, etc., the war upon Japanese monstrosity, and the enlightenment for the social system, as to what is coming against them, and as to which, the West, in its Christian altruism and egotism it is surely coming in contact. Professor Cook's Evolution (Kinetic) in man (see *Relation of Man to Nature* [Medical Fortnightly] by myself) involves kinetic *de* volution: and the agents on each side are as involuntary as are the seeds of food, or of famine that are wafted over the face of the earth by the airs of Heaven.

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If sentience to some degree exists in everything (as some horticulturists have come to assert, and as Haeckel in his "Insulinde" as to particular vegetable growth suggests experimentally), can the green and later rich and glowing grain have altruistic satisfaction at the contemplation of the process that it must undergo in its mission towards the amelioration of the life of contemporaries, all looking under the belief (*and truth*) of a Divine Plan for a glorious outcome *for all* millions of years hence? It is against this egregious Fallacy that I protest—a Fallacy because in no relation except that of the Unknown is it tolerated.

It may be (and is) said that the universality of such a belief or trust or hope (with its varied and often grotesque expressions) is an indication of the probable benign purpose. But, what is benignity *in futuro?* Bah! It is but a word with which to conjure. It is the juggler's trick. Suppose we assume confidently that it is of serious import, leading towards and finally to, a substantiality. Shall I, for instance, be content; shall I, for instance, roll my vicarious blood as a sweet morsel under my tongue, and die with the contorted face of agony, content to have it interpreted by the favored onlookers as the smile of rapture? No! Ever No! That which is not just between man and man, is not just between God and man. I stand for a "square deal" and for it I will stand ever while on earth, as between God and myself, I fear not.

Under what is called The Divine Plan, what is Life except a play of Harpies? What is the preaching of the pulpit except a gloze, or a shiny glaze, upon the surface of a treacherous interior, of God ordained?

What does that gloze, or glaze, except to conceal the devilishness of the system? What system? The System Divine. What mortal can successfully contend against it? Not one. Shall it be further insisted that Christ (of the Occidentals) was the Son of God, sent to redeem the world and bring it back to God, when surely as the sun will continue to rise day after day, Orientalism in its hideous features will come out and make hold upon and pervert that from which it has been hoped the world was free—

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the New World? Indeed, that which was known only sub-rosa (of Japanese, for instance).

Yet only by such laying bare can the world be fore-warned. The discouraging feature is that while the "Di-vine Plan" will thus (hopedly) exterminate the Evil by showing the Japanese the quality of their fancies, thousands upon thousands of the anti-pathetics will themselves become victims.

This is the devilishness of the Natural Law, the law of God. It is the devilishness of our Occidental God Himself if God there be.

These be temperate and sober words, and by them I will stand. I feel an earnestness I cannot suppress.

Omar Khay-Yham asks God "to man's forgiveness give—*and take.*"

God, I make bold to say, is to be pardoned; it is not for Him to pardon man.

And *such is the lesson of the Story of Eden.* The Kaiser of Germany was right in warning the people of Europe to preserve their "highest treasures". ("Volken Europas, wahret eure hochsten Güten." Wilhelm II).

But what does it mean except bloody war or heart-rending silence? Doctors and Reverends, out with the sickly sentimental idea of God and Heaven! Let us teach what God is as developed by His contact with the face of the earth; let us no longer conceal His "true inwardness." Let us take the Proverbs of Soloman, and hang them upon the walls of our dwellings, of our schools, of our lecture rooms. *Let us be a serious people.* Let us do away with sickly namby-pamby pulpit-pratings, or pulpit-platitudes and pretences. *Let us have common sense.* When the son takes up the catechism and reads a page of questions and answers, and looks at his father and says: "Do you believe that?" and the father makes no reply; and the boy says: "If you do not believe it, how can I?" and shuts the book and leaves the room never to open that book again, what has been the result of that Church nonsense except to put the child wholly at the mercy of the world *as it is*, which is not the world that the goody-goody gush has poured into his ears.

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We know that "The System" is such a tangled web that in the warp and the woof, good and evil are inextricably mixed. *Let us say so.* The responsibility is with God *Almighty. Man is to be blamed for nothing.* As I have frequently pointed out, pagan and immoral Japan has become the *bete-noire* of the modern civilized world. Herein is to be found again, as always, the aggravation inflicted upon mankind.

But all this lament, and energy of thought is but waste. All is naught, joy and jest: travail and tears: the old, old story.

All crime is the crime of Nature against man and mankind. But man, the individual, takes upon himself the blameworthiness for the result.

Let us be reasonable; let us be as logical as our reasoning powers shall permit.

If we are not responsible for the activity of our brain and tissue cells (as believers in heredity of crime tell us), then are we indeed involuntaries, and are immediately brought to stand with Calvin, who preached that a certain number of infants are born to be damned. He meant a per cent, of course. What difference between him and Karma (the Sanscrit merit and demerit of intelligent existence) as I understand the teaching of Karma? Each presents a continuing Good and a continuing Evil. But in the operation of The Plan the good is not immune against evil, and the work of demolition goes ever on. Here and there Good modifies Evil, and Evil deterioriates Good, where it does not destroy the Good that it attacks. But Good perseveres in reproducing Good, and Evil perpetuates itself. If they are relative terms then indeed is man unfortunate in all his speculations as to a Divine Immaculate, for the Immaculate is not deemed to be in charge of man's welfare on earth. Then our God is not Purity, Goodness and Truth.

Indeed, what fair argumentative ground have we for supposing that we have such a Divine Governor? Man is a product of evolution. His statutory and social laws he has made to protoct himself against the great principles acknowledged by Calvin and Karma—the Occidental and the

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Oriental. The one is aggressive; the other passive. Extremes meet. Calvin would use fire and sword; Karma would sigh and fold the hands with conviction of utter helplessness. And the one would be as effective as the other.

The Creator is alone responsible for every feature of life.

Two refuges are presented: (1) Faith and the abandonment of Reason; (2) Reason and the abandonment of Faith.

The Rationalist has chosen the latter, and is content. Again extremes meet. When direct opposites come at last to the same point—being the intended and desired destination, then where shall man look for a guide? For a guide to calm?

The Pulpit (a Religion) is best for the many. Religion is an emotion. The members of the congregation encourage each other by the Sunday assembly. The Church must remain. We need it, as a community; as a nation we need it. . . Rationalism is for the individual. Each is an utility. We must select that which is to each the most useful.

I look upon my underlined declaration in a previous paragraph: "*All Crime is Crime of Nature against Man and Mankind,*" as final definitive of all my views (if my views are worthy of consideration); and I give it as a challenge to the world. I look upon it as a Crux, from which is dependent on all sides the spectacle that man is COMPELLED to behold. I have no apology to make for the definition; look upon it only as a form logical that has never before been thus plainly put.

I do not in the slightest sense suggest that any one reply either with or against.

It is my fight; and I believe I shall never be beaten. I am not a "crank." I recognize utilities; and I know society needs utilities.

It is "utility" that makes society useful to individuals, without any dwelling upon the finally utile.

This is not a "kick." It is a period.

(To be continued.)

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EROTIC SYMBOLISM.*

BY HAVELOCK ELLIS, M. D.,

Carbos Water, Lelant, Cornwall, England.

There is ample evidence to show that, either as a habitual or more usually an occasional act, the impulse to bestow a symbolic value on the act of urination in a beloved person, is not extremely uncommon; it has been noted by men of high intellectual distinction; it occurs in women as well as men; it must be regarded as within the normal limits of variation of sexual emotion.

The occasional cases in which the urine is drunk may possibly suggest that the motive lies in the properties of the fluid acting on the system. Support for this supposition might be found in the fact that urine actually does possess, apart altogether from its magic virtue embodied in folk-lore, the properties of a general stimulant. In composition (as Masterman first pointed out) "beef tea differs very little from healthy urine," containing exactly the same constituents, except that in beef tea there is less urea and uric acid. Fresh urine—more especially that of children and young women—is taken as a medicine in nearly all parts of the world for various disorders, such as epistaxis, malaria and hysteria, with benefit, this benefit being almost certainly due to its qualities as a general stimulant and restorative. William Salmon's *Dispensatory*, 1678, shows that in the seventeenth century urine still occupied an important place as a medicine, and it entered largely into the composition of *Aqua Divina*.

Its use has been known even in England in the nine-

*Continued from November, 1906.

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teenth century.* Bourke brings together a great deal of evidence as to the therapeutic uses of urine in his *Scatalogic Rites*; Lusini† has shown that normal urine invariably increases the frequency of the heart beats.

But it is an error to suppose that these facts account for the urolagnic drinking of urine. As in the gratification of a normal sexual impulse, the intense excitement of gratifying a scatalogic sexual impulse itself produces a degree of emotional stimulation far greater than the ingestion of a small amount of animal extractives would be adequate to effect. In such cases, as much as in normal sexuality, the stimulation is clearly psychic.

When, as is most commonly the case, it is the process of urination and not the urine itself which is attractive, there occurs a symbolism of act and not the fetichistic attraction of an excretion. When the excretion apart from the act provides the attraction, we seem usually to be concerned with an olfactory fetichism. These fetichisms in the case of the excretia, seem to be experienced chiefly by individuals who are somewhat weak-minded, which is not necessarily the case in regard to those persons for whom the act, rather than its product apart from the beloved person, is the attractive symbol.

The sexually symbolic nature of the act of urination for many people is indicated by the fact that Bloch, in enumerating various kinds of indecent photographs, refers to a group which he terms "the notorious *pisseuses*." It is further indicated by several of the reproductions in Fuch's *Erotische Element in der Karikatur*, such as Delorme's "La Necessite n'a point de Loi." (It should be added that such a scene by no means necessarily possesses any erotic symbolism, as we may see in Rembrandt's etching commonly called "La Femme qui Pisse" in which the reflected lights on the partly shadowed stream furnish an artistic motive which is obviously free from any trace of obscenity.) The case in which Krafft-Ebing quotes from Maschka of a

*Masterman, *Lancet*, 2 Oct. 1880; R. Neale, Urine as a Medicine," *Practitioner*, Nov. 1881.

†*Archivio di Farmacologia*, fasos 19-21, 1898.

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young man who would induce young girls to dance naked in his room, to leap, and to urinate in his presence, whereupon seminal ejaculation would take place in himself, is a typical example of urolagnic symbolism in a form adequate to produce complete gratification.

A case in which the urolagnic form of scatalogic symbolism reached its fullest sexual development as a sexual perversion has been described in Russia by Sukhanoff.* A young man of 27, of neuropathic temperament, who when he once chanced to witness a woman urinating, experienced voluptuous sensations. From that moment he sought close contact with women urinating, the maximum of gratification being reached when he could place himself in such a position that a woman, in all innocence, would urinate into his mouth. All his amorous adventures were concerned with the search for opportunities for procuring this difficult gratification. Closets, in which he was able to hide winter weather and dull days, he found most favorable to success.†

In a case communicated to me, a young man of aristocratic family, was accustomed to watch the movements of lady guests and, after they had visited their bed-rooms, immediately seek and remove to his own room vessels containing freshly voided urine. One day he was met by a lady who unexpectedly returned to the room she had just left. He was placed under medical observation, but was undoubtedly sane.

In the apparently similar case of a robust man of neuropathic heredity recorded by Pelanda, there was masturbation up to the age of 16, when he abandoned the practice and, up to the age of 30, found complete satisfaction in drinking the still hot urine of women. When a lady or girl in the house went to her room to satisfy a need of this kind, she had hardly left it but he hastened in, overcome by extreme excitement, culminating in spontaneous ejaculation. The younger the woman the greater the transport he experienced. It is noteworthy that in

Archives d' Anthropologie Criminelle, Nov. 19, and *Annalles Medico-psychologiques*, February, 1901.

†A somewhat similar case is recorded in the *Archives de Neurologie*, 1902, p. 462.

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this, as possibly in all similar cases, there was no sensory perversion and no morbid attraction of taste or smell; he stated that the action of his senses was suspended by his excitement, and that he was quite unable to perceive the odor or taste of the fiuid.* It is in the emotional symbolism that the fascination lies, and not in the sensory perversion.

Magnan† records the spontaneous development of this sexual symbolism in a girl of eleven, of good intellectual development but alcoholic heredity, who seduced a boy younger than herself to mutual masturbation, and on one occasion lying on the ground and raising her clothes asked him to urinate on her. This case (except for the early age of the subject) is a fairly typical example of a sporadically occurring urolagnic symbolism in a woman, to whom such symbolism is fairly obvious on account of the close resemblance between the emission of urine and the ejaculation of semen in the man, and the fact that the same conduit serves for both fluids.‡ A urolagnic day-dream of this kind is recorded in the history of a lady contained in Appendix B. History. The natural inevitable character of this symbolism is shown by the fact that among primitive peoples urine is sometimes supposed to possess the fertilizing virtues of semen. J. G. Frazer§ brings together various stories of women impregnated by urine. Hartland‖ also records legends of women impregnated by accidentally or intentionally drinking urine.

The symbolic sexual significance of urolagnia has hitherto usually been confused with the fetichistic and mainly olfactory perversion by which the excretion itself becomes a source of sexual excitement. Long since Tardieu referred, under the name of "renifleurs," to persons who were said to haunt the neighborhood of quiet passages, more especially in the neighborhood of theatres, and who when they per-

*"Pornopatici," *Archivio di Psichiatria*, fasc. 111-iv., 1889, p. 856.
†International Congress of Criminal Anthropology, 1889.
‡Psychology of Sex, Vol. III.
§Pausanias, Vol. IV, p. 189.
‖*Legend of Perseus*, Vol. I, pp. 76, 92.

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ceived a woman emerge after urination, would hasten to excite themselves by the odor of the excretion. Possibly a fetichism of this kind existed in a case recorded by Belletrud and Mercier; a weak-minded, timid youth who was very sexual but not attractive to women, would watch for women who were about to urinate and immediately they had passed would go and lick the spot they had moistened, at the same time masturbating. Such a fetichistic perversion is strictly analogous to the fetichism by which woman's handkerchiefs, aprons or underlinen became capable of affording sexual gratification. A very complete case of such urolagnic fetichism—complete because separated from association with the person accomplishing the act of urination—has been recorded by Moraglia in a woman. It is the case of a beautiful and attractive young woman of eighteen, with thick black hair, and expressive, vivacious eyes, but sallow complexion. Married a year previously but childless, she experienced a certain amount of pleasure in coitus but she preferred masturbation, and frankly acknowledged that she was highly excited by the odor of fermented urine. So strong was this fetichism that when, for instance, she passed a street urinal she was often obliged to go aside and masturbate; once she went for this purpose into the urinal itself and was almost discovered in the act, and on another occasion into a church. Her perversion caused her much worry because of the fear of detection. She preferred, when she could, to obtain a bottle of urine—which must be old and a man's (this, she said, she could detect by the smell)—and to shut herself up in her own room, holding the bottle in one hand and repeatedly masturbating with the other.† This case is of especial interest because of the great rarity of fully developed fetichism in women. In a slight and germinal degree I believe that cases of fetichism are not uncommon in women, but they are certainly rare in a well-marked form, and Krafft-Ebing declared, even in the late editions of his *Psychopathia Sexualis*, that he knew of no cases in women.

*Annales d'Hygiene Publique, June 1904, p. 48.
†Archivio di Psichiatria, (Vol. XIII, fasc. 6, p. 267, 1892.)

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So far we have been concerned with the urolagnic rather than the coprolagnic variety of scatalogical symbolism. Although the two are sometimes associated there is no necessary connection and most usually there is no tendency for the one to involve the other. Urolagnia is certainly much the more frequently found; the act of urination is far more apt to suggest erotically symbolical ideas than the idea of defecation. It is not difficult to understand why this should be so. The act of urination lends itself more easily to sexual symbolism; it is more intimately associated with the genital function; its repetition is necessary at more frequent intervals so that it is more in evidence; moreover its product is much less offensive to the senses than that of the act of defecation, and the act of urination has sometimes furnished a motive to the painter. Still coprolagnia occurs and not so very infrequently, Burton remarked, that even the normal lover is affected by this feeling: "*immo nec ipsum amicae stercus foetet.*"* Of Caligula who, however was scarcely sane, it was said "*et quidem stercus uxoris degustavit.*" In Parisian brothels (according to Taxil and others) provision is made for those who are sexually excited by the spectacle of the act of defecation† (without reference to contact or odor) by means of a "*tabouret de verre,*" from under the glass floor, from where the spectacle of the defecating women may be closely observed. It may be added that the pleasure of such a spectacle is referred to in the Marquis de Sade's novels. The stercoraires are described by Borouordel as watchers of women's urinals.

There is one motive for the existence of coprolagnia which must not be passed over because it has doubtless frequently served as a mode of transition to what, taken by itself, may well seem the least aesthetically attractive of erotic symbols. I refer to the tendency of the nates to become a sexual fetich. The nates have in all ages and in all parts of the world been frequently regarded as one

Anatomy of Melancholy, Part 111, Sect. 11, Mem. 111, Subs. 1.

†Gazette des Hopitano, 1888.

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of the most aesthetically beautiful parts of the feminine body.* It is probable that on the basis of this entirely normal attraction more than one form of erotic symbolism is at all events in part supported. Dühren and others have considered that the aesthetic charm of the nates is one of the motives which prompt the desire to inflict flagellation on women. In the same way—certainly in some and probably in many cases—the sexual charm of the nates progressively extends to the anal region, to the act of defecation, and finally to the excreta.

It may be remarked that while the eating of excrement (apart from its former use and as a magic charm and as a therapeutic agent) is in civilization now confined to sexual perverts and the insane, among some animals it is normal as a measure of hygiene in relation to their young. Thus, as, *e. g.* the Rev. Arthur East writes, the mistle thrush swallows the droppings of its young.† In the dog I have observed that the bitch licks her puppies shortly after birth as they urinate, absorbing the fluid.

In a case of Krafft-Ebing's the subject, when a child of six, accidentally placed his hand in contact with the nates of the little girl who sat next to him in school and experienced so great a pleasure in this contact that he frequently repeated it; when he was ten a nursery governess to gratify her own desire placed his finger in her vagina; in adult life he developed urolagnic tendencies.

In a case of Moll's the development of a youthful admiration for the nates in a coprolagnic direction may be still more clearly traced. In this case a young man, a merchant in a good position, sought to come in contact with women defecating; and with this object would seek to conceal himself in closets; the excretal odor was pleasurable to him but was not essential to gratification, and the sight of the nates was also exciting and at the same time not essential to gratification; the act of defecation appears, however, to have been regarded as essential. He

*See, *e. g.* the previous volume of these *Studies*, "Sexual Selection in Man," pp. 186 *et seq.*, and Duhren, *Geschlechtsleben in England*,, *Bd. II, pp. 258 et seq.*

†Knowledge, June 1, 1892.

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never sought to witness prostitutes in this situation; he was only attracted to young, pretty and innocent women. The coprolagnia here, however, had its source in a childish impression of admiration for the nates. When five or six years old he crawled under the clothes of a servant girl, his face coming in contact with her nates, an impression that remained associated in his mind with pleasure. Three or four years later he used to experience much pleasure when a young girl cousin sat on his face; thus was strengthened an association which developed naturally into coprolagnia.*

It is scarcely necessary to remark that an admiration for the nates, even when reaching a fetichistic degree, by no means necessarily involves, even after many years, any attraction to the excreta. A correspondent for whom the nates have constituted a fetich for many years writes: "I find my craving for women with profuse pelvic or posterior development is growing and I wish to copulate from behind; but I would feel a sickening feeling if any part of my person came in contact with the female anus. It is more pleasing to me to see the nates than the mons, yet I loathe everything associated with the anal region."

Moll has recorded in detail a case of what may be described as "ideal coprolagnia—that is to say, where the symbolism, though fully developed in imagination, was not carried into real life—which is of great interest because it shows how in a highly intelligent subject the deviated symbolism may become highly developed and irradiate all the views of life in the same way as the normal impulse. (The subject's desires were also inverted but from the present point of view the psychological interest of the case is not thereby impaired.) Moll's case was one of symbolism of act, the excreta offering no attraction apart from the process of defecation. In a case which has been communicated to me there was, on the other hand, an olfactory fetichistic attraction to the excreta even in the absence of the person.

In Moll's case, the patient X, twenty-three years of

*Untersuchungen uber die Libido Sexualis, Bd. 1, p. 887.

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age, belongs to a family which he himself describes as nervous. His mother, who is anaemic, has long suffered from almost periodical attacks of excitement, weakness, syncope and palpitation. A brother of the mother died in a lunatic asylum and several other brothers complain much of their nerves. The mother's sisters are very good-natured but liable to break out in furious passions; this they inherit from their father. There appears to be no nervous disease on the patient's father's side. X's sisters are also healthy.

X. himself is of powerful, undersized build and enjoys good health, injured by no excesses. He considers himself nervous. He worked hard at school and was always the first in his class; he adds, however, that this is due less to his own abilities than the laziness of his school-fellows. He is, as he remarks, very religious and prays frequently, but seldom goes to church.

During his school-days he had periodic fits of depression and misanthropic depression. He refers also to his extreme pedantry at this period. These fits are now much less marked. In society he is not communicative.

In regard to his psychic character he says that he has no specially prominent talent, but is much interested in languages, mathematics, physics and philosophy, in fact in abstract subjects generally. "While I take a lively interest in every kind of intellectual work," he says, "it is only recently that I have been attracted to real life and its requirements. I have never had much skill in physical exercises. For external things, until recently, I have only had contempt. I have a delicately constituted nature, loving solitude, and only associating with a few select persons. I have a decided taste for fiction, poetry and music; my temperament is idealistic and religious, with strict conceptions of duty and morality and aspirations towards the good and beautiful. I detest all that is common and coarse, and yet I can think and act in the way you will learn from the following pages."

Regarding his sexual life X has made the following

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communication: "During the last two years I have become convinced of perversion of my sexual instinct. I had often previously thought that in me the impulse was not quite normal, but it is only lately that I have become convinced of my complete perversion. I have never read or heard of any case in which the sexual feelings were of the same kind. Although I can feel a lively inclination towards superior representatives of the female sex, and have twice felt something like love, the sight or the recollection even of a beautiful woman have never caused sexual excitement." In the two exceptional instances mentioned, it appears that X. had an inclination to kiss the women in question, but that the thought of coitus had no attraction. "In my voluptuous dreams, connected with the emission of semen, women in seductive situations have never appeared. have never had any desire to visit a harlot. The love stories of my fellow-students seemed very silly, dances and balls were a horror to me, and only on very rare occasions could I be persuaded to go into society. It will be easy to guess the diagnosis in my case: I suffer from the sexual attraction of my own sex, I am a lover of boys.

"You cannot imagine what a world of thoughts, wishes, feelings and impulses the words 'Knabe,' 'garcon,' 'boy,' 'ragazzo' have for me; one of these words, even in an unmeaning clause of the translation-book, calls before me the whole sum of associations, which in course of time have become bound up with this idea, and it is only with an effort that I can scare away the wild band. This group of thoughts shows a wonderful mixture of warm sensuality and ideal love; it unites my lowest and highest impulses, the strength and weakness of my nature, my curse and my blessing. My inclination is especially towards boys of the age of 12 to 15; though they may be rather younger or older. That I should prefer beautifu and intelligent boys is comprehensible. I do not want a prostitute, but a friend or a son, whose soul I love; whom I can help to become a more perfect man, such as I myself would willingly be.

"When I, myself, belonged to that happy age (*i. e.* be-

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low 15) I had no dearer wish than to possess a friend of similar tastes. I have sought, hoped, waited, grieved, and been at last disillusioned, overcome by desire and despair, and have not found that friend. Even later the hope often reappeared, but always in vain, and I cannot boast of that sure recognition which one reads of in the autobiographies of Urnings. I do not know personally a single fellow-sufferer. It is also doubtful whether such an acquaintanceship would greatly help me, for I have a very peculiar conception of homosexuality. As you will see, I have little more in common with what are called pæderasts, than sexual indifference to the female sex, and I often ask myself: 'Does any other man in the whole world feel like you? Are you alone in the earth with your morbid desires? Are you a pariah among pariahs, or is there perhaps another soul with similar longings living near you?' How often in summer have I gone to the lakes and streams outside cities to seek boys bathing; but I always came back unsatisfied, whether I found any or not. And in winter I have been irresistibly impelled to return to the same spots as if it were sanctified by the boys, but my darlings had vanished and cold winds blew over the icy floods, so that I would return feeling as though I had buried all my happiness.

"It must be borne in mind, therefore, that what I have to say regarding my sexual impulses only refers to fancies and never to their practical realization. My sensual impulses are not connected with the sexual organs; all my voluptuous ideas are not in the least connected with these parts. For this reason I have never practiced onanism and *immissio membri in anum* is repulsive to me as to normal man. Even every imitation of coitus is, for me, without attraction. In a boy's body two things especially excite me: *his belly and his nates*, the first as containing the digestive tract, the second as holding the opening of the bowels. Of the vegetable processes of life in the boy, none interest me nearly so much as the progress of his digestion and the process of defecation. It is incredible to what an ex-

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tent this part of physiology has occupied me from youth. If, as a boy, I wanted to read something of a piquantly exciting character, I sought in my father's encyclopaedia for articles like: Obstruction, Constipation, Haemorrhoids, Faeces, etc. No function of the body seemed to be so significant as this, and I regarded its disturbances as the most important in the whole mechanism of life. The description of other disorders I could read in cold blood, but intussusception of the bowels makes me ill even to-day. I am always extremely pleased to hear that the digestion of people around me is in good condition. A man who did not sufficiently watch over his digestion aroused distrust in me and I imagined that wicked men must be horribly indifferent regarding this weighty matter. Even more than in ordinary persons was I interested in the digestion of more mysterious beings, like magicians in legends, or men of other nations. I would willingly have made an anthropological study of my favorite subject, only to my annoyance books nearly always pass over the matter in silence. In history and fiction I regretted the absence of information concerning the state of my heroes' digestion when they languished in prison, or in some unaccustomed or unhealthy spot. For this reason I held no book more precious than the one which describes how a young man, after being shipwrecked, lived for a long time in a narrow snow-hut, and it was conscientiously stated that he became conscious of digestive disturbances. No immorality angers me more than the foolish practice of ladies who in society neglect the satisfaction of their natural needs from misplaced motives of modesty. On a railway journey I suffer horribly from the thought that one of my fellow-travellers may be prevented from fulfilling some imperative natural necessity.

"I naturally devote the greatest attention to my own digestion. With painful conscientiousness I go to stool every day at the same hour; if the operation does not come off to my satisfaction, I feel not so much physical as mental discomfort. To this quite useful hygienic interest became associated at puberty a sensual interest. Since

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my fourteenth year I have had no greater enjoyment than to defecate undressed (I do not do so now) after having first carefully examined the distention of my abdomen. In summer I would go into the woods, undress myself in a secluded spot and indulge in the voluptuous pleasures of defaecation. I would sometimes combine with this a bath in a stream. I would exhaust my imagination in the effort to invent specially enjoyable variations, longed for a desert island where I could go about naked, fill my body with much nourishing food, hold in the excrement as long as possible, and then discharge it in some subtly thought-out spot. These practices and ideas often caused erections and later on emissions, but the genitals played no part in my conceptions; their movements were uncomfortable and gave no pleasure.

"I soon longed to be associated in these orgies with some boy of the same age, but I wanted not only a companion in my passion but also a real friend. Since there could be no question of masturbation or paedicatis, our love would have been limited to kisses, embraces, and—as a compensation for coitus—defaecation together. That would have been perfect bliss to me. I will spare you the unaesthetic contents of my voluptuous dreams. But I remained without a companion and therefore without real enjoyment. (He has, however, on various occasions, experienced erections, and even emissions, on seeing by chance men or boys defaecate.) *Hinc illae lacrimae*, the excitement over my own defaecation, only took place *faute de mieux*.

"I knew very well that my thoughts and practices were impure and contemptible. Ah! how often, when the intoxication was over, have I thrown myself remorsefully on my knees, praying to God for pardon! For some weeks I repressed my longing; but at last it was too strong for me, I tried to justify myself and fell into my vice anew. That I was guilty of licentiousness and loved boys sexually first became clear to me later on, when I knew the significance of erection as a sign of sexual excitement.

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"No one can imagine with what demoniacal joy I am possessed at the thought of a beautiful naked boy whose abdomen is filled as the result of long abstinence from stool. The thought powerfully excites me, a flood of passion goes through my blood and my limbs tremble. I never would grow tired of feeling that belly and looking at it. My passion would express itself in tempestuous caresses, and the boy would have to assume various positions in order to show off the beauty of his form, *i. e.*, to bring the parts in question into better view. To observe defaecation would still further increase this peculiar enjoyment. If the boy's bowels were not sufficiently filled I would feed him with all sorts of food which produces much excrement, such as potatoes, coarse bread, etc. If possible I would seek to delay defaecation for two or three days, so that it might be as copious as possible. When at last it occurred, it would be an unspeakable joy for me to watch the dung—which would have to be fairly firm—emerging from the anus."

X. would like to be a teacher and thinks he could exert a beneficial influence on boys. In spite of the pain he has suffered, he does not think he would like to be cured of his perverse inclinations, for they have given him joy as well as pain, and the pain has chiefly been owing to the fact that he could not gratify his inclinations. X. smokes and drinks in moderation and has no feminine habits.*

The case of coprolagnia communicated to me is tha of a married man, normal in all other respects, intellectually brilliant and filling successfully a very responsible position. When a child the women of his household were always indifferent as to his presence in their bedrooms and would satisfy all natural calls without reserve before him. He would dream of this with erections. His sexual interests became slowly centered in the act of defaecation, and his fetich throughout life never appealed to him so powerfully as when associated with the particular type of household

*Moll, *Kontrare Sexualempfindung*, 3rd ed. p

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furniture which was used for this purpose in his own house.

The act of defaecation in the opposite sex, or anything pertaining to or suggesting the same, caused uncontrollable sexual excitement; the nates also exerted a great attraction. The slime excreta exerted this influence even in the absence of the woman; it was, however, necessary that she should be a sexually desirable person. The perversion in this case was not complete; that is to say that the excitement produced by the act of defaecation, or the excretion itself, was not actually preferred to coitus, the sexual idea was normal coitus in the normal manner, but preceded by the visual and olfactory enjoyment of the exciting fetich. When coitus was not possible, the enjoyment of the fetich was accompanied by masturbation (as in the analogous case of urolagnia in the woman summarized.) On one occasion he was discovered by a friend in a bedroom belonging to a woman, engaged in the act of masturbation over a vessel containing the desired fetich. In an agony of shame he begged the mercy of silence concerning this episode, at the same time revealing his life-history. He has constantly been haunted by the dread of detection, as well as by remorse and the consciousness of degradation, also by the fear that his unconquerable obsession may lead him to the asylum.

The scatalogic groups of sexual perversions, urolagnic and coprolagnic, as may be sufficiently seen in this brief summary, are not merely olfactory fetiches. They are in a larger proportion of cases dynamic symbols, a preoccupation with physiological acts, which by associations of contiguity and still more of resemblance, have gained the virtue of stimulating in slight cases and replacing in more extreme cases the normal preoccupation with the central physiological act itself. We have seen that there are various considerations which amply suffice to furnish a basis for such associations. And when we reflect that in the popular mind, and to some extent in actual fact, the sexual act is like urination and defaecation, an excretory

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act, we can understand that the true excretory acts may easily become symbols of the pseudo-excretory act. It is indeed in the muscular release of accumulated pressures and tensions, involved by the act of liberating the stored-up excretion, that we have the simulacrum of the tumescence and detumescence of the sexual process.*

In this way the erotic symbolism of urolagnia and coprolagnia is perfectly analogous with that dynamic symbolism of the clinging and swinging garments, which Herrick has so accurately described, with the complex symbolism of flaggellation and its play of the rod against the blushing and trembling nates, or with the symbols of sexual strain which are embodied in the foot and the act of treading.

(*To be concluded.*)

*In the study of *Love and Pain* in a previous volume (p. 130) I have quoted the remarks of a lady who describes the analogy between sexual tension and vesical tension. "Cette volupté que ressentent les bords de la mer, d'etre toujours pleins sans jamais déborder"—and its erotic significance.

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NEURONES IN THE LIGHT OF OUR PRESENT KNOWLEDGE.

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TEN years ago the "Neuron theory," *i. e.* the theory that the nervous system was made up of a collection of anatomical and genetic nerve entities or units constituted of cell, fiber and terminal ramifications, having no connection save by contiguity, was generally accepted. In 1891, Waldeyer, the Berlin anatomist, set forth the idea of the neuron based largely upon the conception of Gerlach and Deiters and upon work that had been done by means of the Golgi and Cajal methods of staining, which, as is well known, reveal particularly the outlines of nerve cells. He maintained that nerve fibers are collections of axis cylinders which emerge directly from nerve cells, that there is no relationship to a fiber network at the point of origin, and that all nerve fibers end free in terminal ramifications without anastomosis or network formation of any kind. The neuron theory seemed entirely to harmonize with the cell theory, and the application of it to the problems of neuropathology seemed to divest many of them, particularly the systemic and combined systemic diseases, of their obscurities. In

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short, it appeared to harmonize so well with physiological, histological, and pathological teachings that it soon became almost universally accepted. It is not our purpose to call particular attention to the wide application of the neuron theory to clinical medicine and to psychology, nor to the fact that in some instances it has been carried to an absurd degree.

Gradually in latter years an increasing interest has developed in the histology and microchemistry of the nervous system; and with this has come from many workers in these fields a decided opposition to the neuron theory so that to-day it is in the strict sense partially or wholly rejected by many of the most trustworthy workers in the fields of neurohistology and biology. Apathy, Bethe, Nissl, and others have sought to establish that the fibrils of nerve cells form a continuous system, without beginning, without end, like the vascular system, binding one cell body with another and thus uniting the neurons between them. Without in any sense holding a brief for those who oppose the neuron theory, we propose briefly to review some of the more important evidence that now exists to show that the nervous system is not made up of a collection of units, of invariable constitution with free endings, having no connection with one another save by contiguity, and to attempt a judgment of the evidence thus reviewed.

The temporal evolution of our knowledge of the nervous system falls into periods. The work that was done from 1835 to 1885—fifty years—and the work that has been done since 1885—twenty years.

After the discovery of the nerve cells by the zoologist Ehrenberg, and the study of them by Valentin, Purkinje, Wagner, and others, it was demonstrated by Deiters that nerve cells were made up of a cell-body and prolongations, protoplasmic and axis-cylinder prolongations, unlike in structure and behavior; the former being of the same constitution as the cell, split up soon after their origin, and terminate not far from the cell. The latter, of much more compact structure, were directly continuous, Deiters maintained, as nerve-fibers.

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When Remak depicted axis-cylinders, or, as he called them, the "primitive bundles," he described them as finely-striated structures, but not distinctly fibrillated as did Fromann in 1864. The latter depicted fine fibrillary striations in the cells of the anterior horns and in their protoplasmic prolongations, especially distinct in the latter. The opinion generally held at that time by anatomists was that axis-cylinders or "primitive bundles" were homogeneous in structure and that their peripheral terminations, at least in case of muscle plates, were in ends external to or beneath the sarcolemma.

In 1859 Lionel S. Beale, Professor of Physiology and Pathology in King's College, London (whose death was recently announced,) published an article in the Philosophical Transactions (1860, page 611) in which he maintained that complete nerve circuits existed, *i. e.* that there was no free ending of nerve fibers anywhere. Nerve fibers, he said, passing to a muscle, divide into a vast number of exceedingly fine pale granular fibers which ramify upon the external surface of the sarcolemma, connected with which fibers at certain intervals are oval nuclei; and these fine fibers, after an extensive, and in many cases very circuitous course, join with other fibers to form dark bordered fibers which at length pass toward the nervous center either in the same bundle as the dark bordered fibers passing toward the muscles, or in other bundles.

He prepared tissues for examination by soaking them in or injecting them with some highly refractive fluid such as simple syrup or glycerin to which a little chromic acid had been added. Beale did an enormous amount of work in support of his claims, published various articles, illustrating them with excellent drawings, and offered to demonstrate his specimens to anyone who would take the trouble to look at them. He concluded from his work upon the different tissues of the body that nerve fibers never end or terminate by free extremities, but that in all cases complete circuits exist and that the circuit is the fundamental origin of the nervous apparatus. In other words, his position was

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almost identical with that of those who hold to the neurofibril theory of to-day. Beale was treated with scant courtesy by his contemporaries and apparently even that was accorded to him only because of personal friendship with some of the leading German anatomists. Kühne, Kölliker, Margó, and Engelmann all denied the accuracy of his diagrams and the reality of his descriptions, while some of the French anatomists, notably Rouget, essayed disdainfulness and superiority, saying: "It is easy to assure one's self that the description of Beale is wholly inexact and no time should be wasted upon it by the experienced and attentive observer." Time has shown that Beale was accurate to a degree that can scarcely be believed when one remembers that the only reagents that he worked with were syrup and glycerin. It is largely due to Joris, in his prize essay published by the Belgian Royal Academy of Medicine, "Nouvelles Recherches sur les Rapports Anatomiques des Neurones," that attention has been called to the remarkable work of Beale. In the hundreds of articles, monographs, and reviews that have been written on neurons and neurofibrils in the past ten years, Beale's name is not mentioned. For instance, Bethe, in the third chapter of his "Allgemeine Anatomie und Physiologie des Nervensystems," says that the fibrillary structure of the nerve cells and its prolongations received its first great impetus from Schultze. In reality Schultze confirmed the discoveries of Beale while demonstrating the existence of isolated nerve fibrils and showing that they were specific elements of the nervous tissue. His article formed a chapter in Stricker's Handbuch der Geweblehre, 1871, which, being the most popular textbook of histology in the German language, was widely read and became very generally known. On the other hand, Beale's articles were published in the *Philosophical Transactions*, a vehicle rarely encountered by German savants, it would seem, and in the *Archives of Medicine*, of which he was editor. His position as a teacher, his membership in the R y Soci y, hs repute as a master of microscopical technique, apparently did not help him to a serious hearing. That Beale was master of the situation, however, and that

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he believed firmly in his findings, can be proven to anyone who will take the trouble to read the article in the *Archives of Medicine,* Volume IV., 1863-1870, entitled "An Anatomical Controversy," in which he deals with those who sat in judgment upon him in a most masterful manner.*

There is no doubt whatsoever that Max Schultze extended Beale's ideas very materially, but Schultze had the advantage of examining cells of tissues that had been hardened in chrome salts, in iodized serum, and in osmic acid and bichromate of potash. Schultze showed that the "primitive bundles," as he called them, constituted the specific structural element of the nervous substance. He demonstrated the distinct fibrillary striations which are entirely independent and parallel both in the protoplasmic and in the axis-cylinder prolongations. He pointed out that the non-medullated fibers split up at the end so as to form a bush-like condition of the finest fibrils. In ganglion cells treated with iodized serum he was able to see the finest striations and to trace these striations through the entire cell from one side where they came in to the other side where they passed out through other prolongations. In other words, he showed to his own satisfaction that the fibrils did not originate in the body of the cell. These discoveries led him to the conclusion that the fibrils were the essential thing in the construction of the nervous system, and that ganglion cells were no more than stations for the fibrils, which stations served to make it possible for fibrils coursing in a prolongation to get into connection with many other prolongations and also with axis-cylinders. His idea was that the nerve fibers were simple fibrillary bundles, and he therefore divided them into two classes—naked fibrillary bundles

*In Vol. V. of the same journal will be found an unsigned article entitled "German Criticism and British Medical Science," undoubtedly from the pen of Dr. Beale, which throws an interesting side light upon the controversy: "It has been said that science is of no nationality. . . . Such dreams must be dispelled; Germany has spoken; the investigation of Nature's minutest and most delicate secrets is *her* prerogative only. Anatomical observations are made in Germany only, and it is not possible to discover any structure elsewhere. Other countries must expect and listen to the story of what she finds. To her alone belongs the right to discover! Nay, it is doubtful if light for microscopical illumination is to be obtained elsewhere."

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and fibrillary bundles with medullary sheaths. Despite the fact that this line of investigation was pursued with much success by other investigators, and notably by Kuppfer (who, by the way, Apathy states, was the real discoverer of the neurofibrils, Sitzungsber. d. Naturwissenschaft. Atlas d. Bayerish Acad. d. Wissensch. Med., 1883, page 473,) H. Schultze, Dogiel, Flemming, and many others, it was not until 1897 when Apathy made his contribution entitled "Das Leitende Element des Nervensystems und seine Beziehungen zu den Zellen" (Mitteilhungen der zoologischen Station, Neapel, Volume XII.), that neurofibrils began to have an important place in the literature of neurology and histology. In several communications dating back to 1883, he had pointed out the fundamental facts of his observations and conclusions, but these were published principally in thc Hungarian language and were unnoticed. In the volume that appeared in 1897 the pen pictures and verbal descriptions were so distinct and comprehensive that at once the matter was given the attention which it demanded. He maintained that the neurofibril is the essential and specific constituent of the nervous system. He had studied in detail the nervous system of the leech by the aid of a method, now well known, which depicted the nerve fibrils with such distinctness that they could be followed from one end of the preparation to the other. These neurofibrils appeared as deep dark threads on a slightly tinged background, or, as Bethe says, like telegraph wires against a clear sky. On cross-section of sensory or motor fibers they appear as dark spots or small, somewhat spiral lines, indicative of their spiral course.

These neurofibrils were found wherever there w s nerve organization, *i e.* in nerve fibers, in ganglion c' s, in sensory epithelial cells, in glandular cells, and in all these tissues they were sharply differentiated. There was no vagueness about their outline, they were well-defined, individual morphological elements and nowhere could an ending of one of the neurofibrils be found. Apathy believed the individuality of the neurofibril, the unnterrupted course, and the endlessness to be its most striking

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features. In end organs, such as muscle fibers, sensory epithelial cells, glandular cells, etc., the fibrils interlace so as to form networks. In ganglion cells they seem to terminate in a similar way. The majority of the fibrils which enter ganglion cells through the protoplasmic prolongations of unipolar cells or through the many prolongations of the multipolar cells, interlace in such a ashion as to form a very intricate network. A similar network formation is found in the neuropil (the nerve cell in contradistinction to the ganglion cell), only the very fine network occupying the center of the cell, is made up of very many more fibrils. Conducting primitive fibrils pass into the interior of the ganglion cell, and just as many elementary fibers leave it after the "trellis formation." Termination, dissolution in or connection with the cell nucleus the fibril does not have.

n nis conception of Apathy, the neurofibrils either go toward centers and penetrate ganglion cells, or they go toward the periphery and ramify around muscle cells and penetrate sensory or secretory cells. In invertebrates Apathy demonstrated motor fibers which extend from the cell to the muscle to which they go, and sensory fibers very much thinner than the motor which pass into the "elementary trellis" and from there into the cell. Apathy divides the cells of the nervous system into two distinct classes—nerve cells and ganglion cells. The former are analogous to muscle cells; they produce the material that conducts, *i. e.* the material that produces fibrils.

The ganglion cells are interpolated in conductive paths like cells in an electric circuit; they produce that which is to be conducted. In ganglia these ganglion cells are arranged around the periphery and are of two kinds, large and small. Neurofibrils entering the large cells form at once an intramedullary network and from this network new fibrils detach themselves and go out through the same prolongation. Thus a prolongation conducts in two directions. Primitive fibrils may pass through a number of ganglion cells before they enter into the formation of networks. In the prolongation of the

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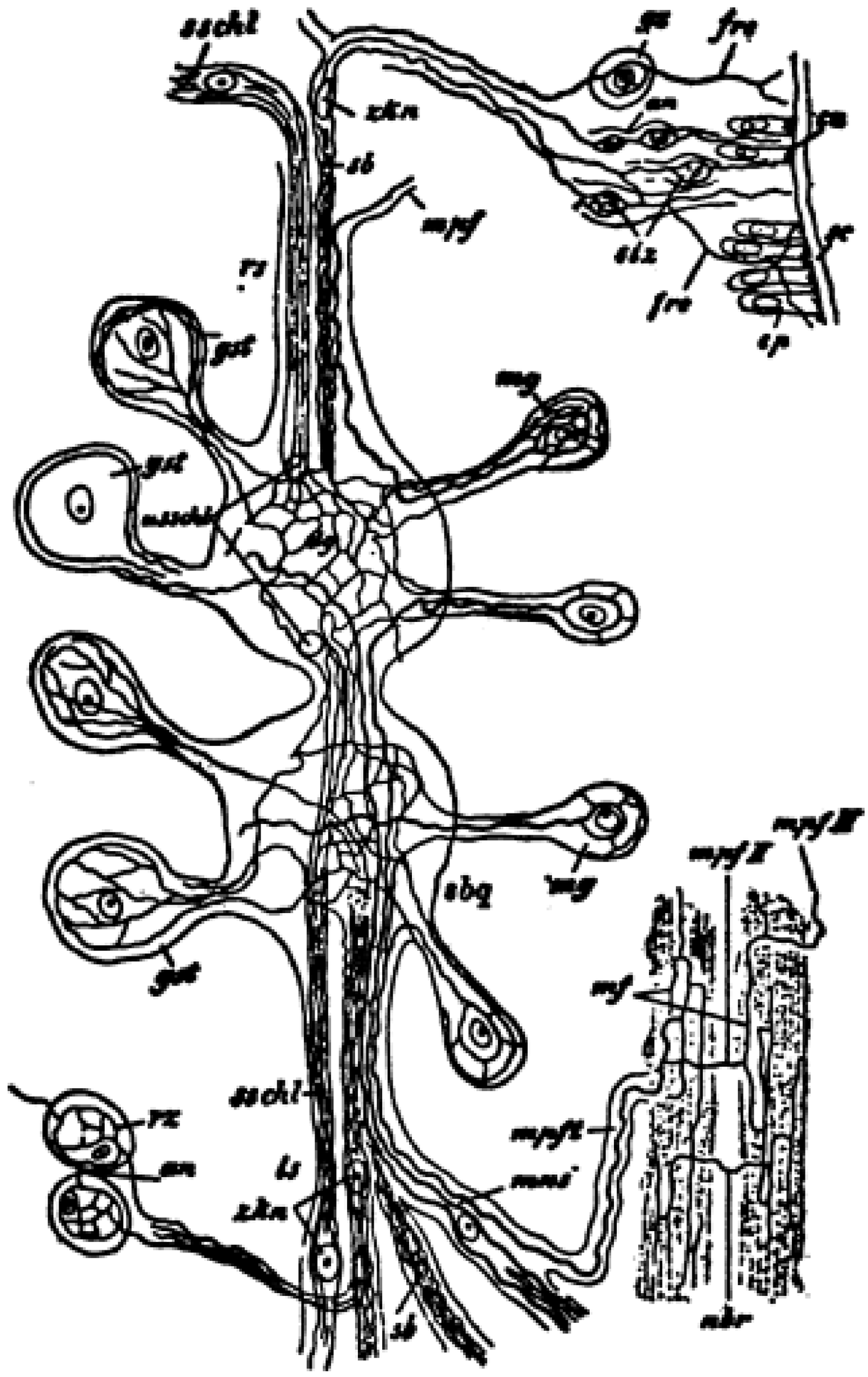

FIG. 1.—Apathy's Schema of course and communication of the conducting pathway in cross-section of a cornite of Hirudo. The two ganglion valves with motor *mg*, and sensory or merely connecting *gsl* ganglion cells. The three kinds of nerve spindles or nerve fibers *sb*, *sschl*, *mns*, their arrangement in the center, distribution in the central mass of fibers and connections with the ganglion cells; their arrangement at the periphery: muscle fibers, epidermal and subepidermal sensory cells with their terminal branching in its epidermis (*fre*), *sschl* where a sensory tube *sbq*, where a sensory bundle curves into the central mass of fibers in a longitudinal direction, *mbr* conducting bridges between muscle fibers. We see from the upper right the perceptive sensory surface, the centripetal conducting febril path, which enters into the elementary gutter and thence in the ganglion cell and its mesh work. Thicker fibers which later become united in bundles as the motor nerves pass from the motor ganglion cells to muscle (lower right) and branch in the manner already described.—(From Hartmann, "*Die Neurofibrillenlehre*.")

small cells there is to be found an individual fiber which is characterized by its considerable volume: this is the motor fiber. All fibrils coming out from ganglion cells enter the formation of a common network occupying the center of

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Fig. 2.—B elementary network of Golgi net, from which the neurofibrils develop and pass into the cell. The same at M N with the fibrile. L elementary fibers passing from the nervous grey into the Golgi net. A nervous gray; C axone hillock without Golgi net. X axone; H myeline sheath; I K connection of axone with nervous grey after Nissl.

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the ganglion. This common network is the "elementar gitter" of Apathy, or, as it may be translated, elementary trellis or screen. In some instances fibrils come directly from the cell without passing through this central network.

At the periphery of the body there is a very similar disposition of the nervous element. The neurofibril forms in the secretory cell an intracellular network, whose branches leave the cell and anastomose with fibrils coming from neighboring cells to form intercellular networks.

In 1896 the teachings of Apathy were accepted by Bethe, who confirmed his findings in invertebrates by the use of other methods of investigation. Extending Apathy's conception, Bethe attempted to show that in the phylogenetic development of animal life, so called plasmatic nervenets constitute the lowest method of connection of nerve cells. The fibrils of these plasmatic networks form only the intercellular trellis which constitutes the direct connection between the peripheral sensorium and the muscles. In the nervous system of all higher animals there occurs somewhere a mixture of the fibrils coming anywhere from the surface which make up the fibril trellises, and, according to Bethe, it is the position of this trellis which constitutes the difference between the different forms.

As we ascend in the scale of the vertebrates we find that the fibril gets more and more outside the cell, until finally it gets entirely out between the cells, so that according to Bethe's view, within cells fibrils merely pass through having no more intimate relation than that caused by such passing. Either the fibril trellises remain near each other and have long pathways to receptory and effectory organs, or long pathways form between remote fibril trellises. Recent work done according to the methods of Cajal and Bielchowsky seems to corroborate in general Bethe's opinions, but it is difficult to obtain reliable information of the fibrils in central cells with these methods. Apathy maintains that there is an intercellular trellis formation in vertebrates. Hartmann (Die Neurofibrillenlehre, Braumüller, Vienna and Leipzig, 1905) is inclined to accept this inasmuch

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as his preparations showed that a part of the fibrils which pass into many ganglion cells have a trellis formation which, in the large pyramidal cells, for example, lies near the basal part of the cell; in the smaller cells this takes up nearly the entire cell.

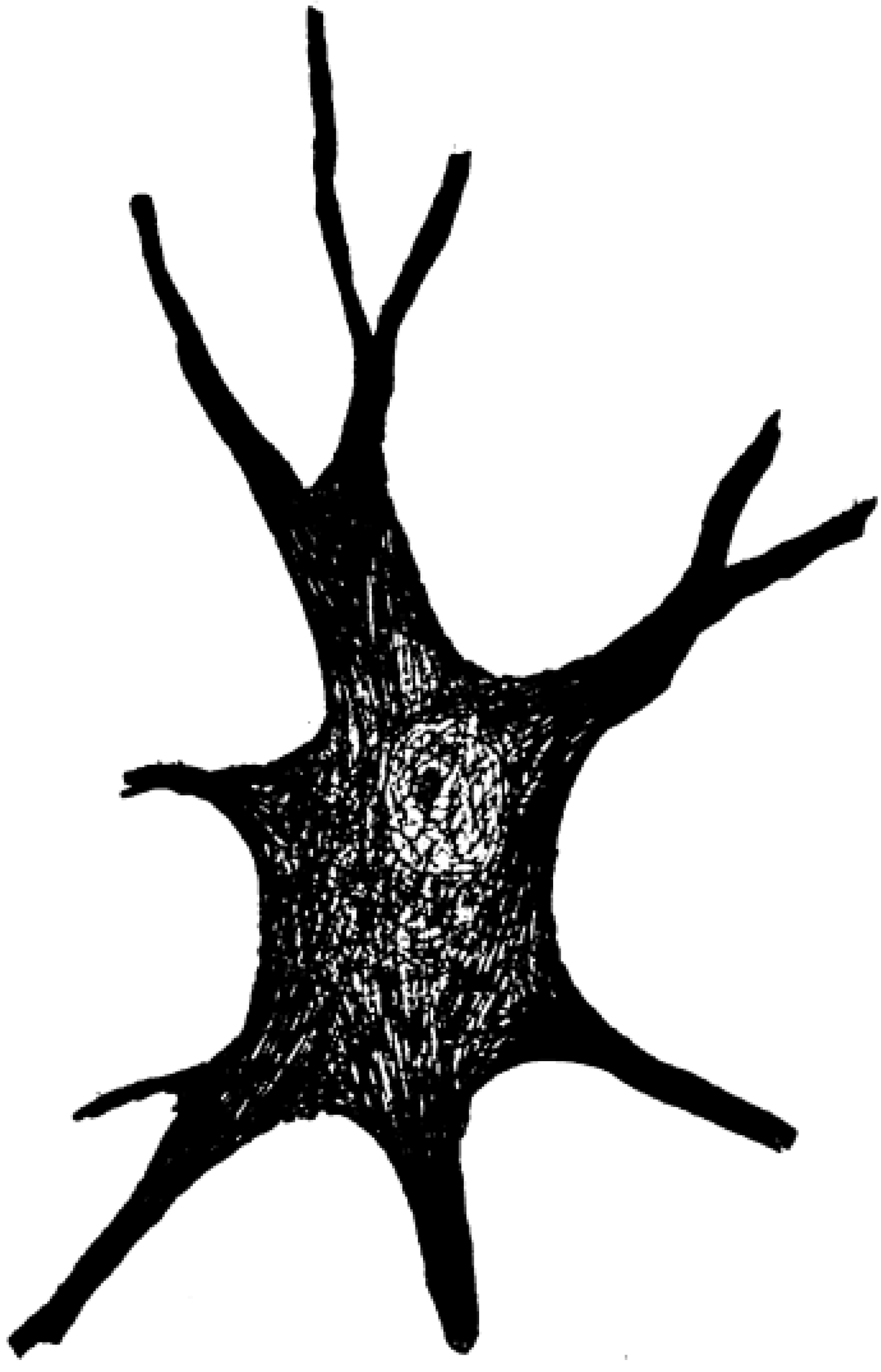

Fig. 3.—Large multipolar cell from the reticular formation of the medulla of a rabbit. (Cajal method.)

In addition, fibrils in variable numbers go from dendrite to dendrite and from axis cylinder to dendrite through the cell without perceptible relation one to another.

Bethe also found by his method that ganglion cells of vertebrates are surrounded by a close-meshed net-form trel-

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lis which he calls the Golgi net and which he believes is of nervous nature.

He has framed an hypothesis concerning the transmission of the nervous current from this network to the cell and to the dendrites. The dendrites, *i. e.*, the protoplasmic processes, of the cells end blind. Probably the fibrils pass into Golgi nets and unite with the fibrils which proceed from the splitting up of the centripetal nerve fibrils to form network formations as in invertebrates.

Nissl agrees that the Golgi net is a new important structural element of the nervous system, but he does not believe that the neurofibrils go out from the protoplasmic prolongations unchanged into the terminal endings of the centripetal medullated fibers. This Golgi network Bethe finds at the surface of all the cells of the central nervous system. In the cerebrum, cerebellum, Ammon's horn, and in the gelatinous substance it extends diffusely. In other regions such as the motor nuclei, the dentate nucleus, the olives, etc., it confines itself to the surface of the cell, but where two cells or two dendrites touch the Golgi network reaches from one directly to the other. It is limited to the gray matter. It does not seem to have any relationship to the vessels, the neuroglia, or the pia. But the nervous nature of this Golgi network, unfortunately for Bethe's theory, has not been proven. Cajal, Lugaro, Donnagio, Marinesco, and others maintain that this network represents nothing else than artificial coagulations of certain albuminoid substances in the interior of vessels. Nissl changes Bethe's hypothesis so that the neurofibrils of the cell border and in the terminal ramifications undergo a change which permits their colorability, a condition previously impossible. (See Fig. 2.)

Bethe's conclusion is that the nerve fibril is a multicellular formation in which the ganglion cells and the end organs are united by neurofibrils, the ganglion cells themselves being of slight functional value. The neurofibrils are the essential specific constituent of the nerves and they are the nerve substance in general. Engelmann's opinion that

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the axis cylinder section of medullary substance and the nucleus of Schwann, situated between two nodes of Ranvier may be looked upon as a cell, it has been thought, has received corroboration from Bethe, who found, he maintains, that at Ranvier's nodes the fibrils alone pass through a sieve-like membrane. This, he thinks, fortifies the opinion that these constitute the confines of the cell. Retzius insists that at the above-mentioned places not only the neurofibrils but also the perifibrillary substance is seen to pass through, that the number of the neurofibrils and also the perifibrillary substance is decreased, therefore a rarefaction of the entire substance of the axis-cylinder takes place at the nodes of Ranvier.

Nissl maintains that the complex called a neuron is not the sole nerve element. There are cellular elements which do not have their origin from ganglion cells, and there is a specific tissue of as yet unknown texture lying outside the cells, the so-called "nervous gray." (Fig. 2.) This substance is of a fibrillary nature. According to him, dendrites as well as axis-cylinders terminate blind in this gray substance. Therefore, something must exist which is interpolated between the end of the axis-cylinder which is synonymous with the cessation of the medullary sheaths, and the Golgi nets and the nerve cells situated in the vicinity of the axis-cylinder termination. This is the nervous gray. He has never been able to demonstrate it, but he has attempted to show mathematically that this nervous substance must exist. He says that if the demonstrable cortical elements are added together a large portion of space remains unoccupied, but the work of Beilchowsky and Wolff on the cerebellum by the use of the former's silver method which impregnates neurofibrils and plasma with a remarkable clearness and which demonstrates the continuous transition of axis-cylinder fibrils and closely united peri- and intracellular nets, would tend to upset this.

Ansalone has pointed out (Contributo allo studio delle Neurofibrille nella midolla spinale dei vertebrati superiori, *Annali di Neurologia*, Ann. XXII., fasc 3, 1904) that the

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neurofibrils of the cells in the spinal cord vary in appearance according to the region of the cell which is under inspection. The prolongations also present very variable pictures. In the peripheral portion of the cell there is no network in the proper sense of the term, the neurofibrils running in the shape of thick cords from one pole to the cell to the other, without dividing or anastomosing. The cellular element is not at all differentiated from the surrounding tissue; and it stands in connection with fine fibrils which reach it in a direction nearly perpendicular to that of the neurofibrils. In the deeper regions of the cell the neurofibrils form a network, the communications of which with the nucleus vary according to the section plane of the cell. The fibrillary network may either cover the nucleus completely, presenting a greater condensation and a finer quality of mesh at this level, or it may pass over it like a bridge in the form of more delicate threads. Again, it may be strictly limited to the nuclear outlines where it terminates.

Schaffer, who has recently published a paper on the subject (Recherches sur la structure dite fibrillaire de la cellule nerveuse, *Revue Neurologique*, No. 21, 1905) comes to somewhat different conclusions. The author investigated the finer fibrillary structure of the nerve cells in the spinal cord, the oblongata, and the pyramidal cells of the cortex and concluded that there are two systems of reticular structures in the nerve cells; first, a pericellular external network with thicker meshes at the periphery of the cell-body and in the protoplasmic processes, which is identical with Golgi's net; the beams of this network which represent a sort of cortical substance of the cell, form the meshwork of the cell process also, which become more plainly outlined in the presence of swelling from the general parallel arrangement of the fibrils. All the fibrils of the cell-body as well as the processes anastomose with each other and the fibrillary cellular structure is therefore really a pseudofibrillary structure of a reticular character, although presenting a parallel striped appearance in certain localities. Another net is formed by fine fibrils, which form a polygonal wide meshwork, by branching off from the cross-

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beams of the first net towards the interior. This internal reticular system appears denser around the nucleus; it also sends its prolongations into the protoplasmic processes. The internal and the external intracellular network stand in close connection with each other. The author finally observed extracellular fibrils which approach the cell-body in a Y-shaped oblique direction, or parallel to the pericellular network, blending with the body. The Y-shaped branching of the fibrils he also considers with Bethe as sufficient proof of the existence of an endocellular network.

Donnagio, working with an original method (Anatomia e fisiologia delle vie di conduzione endocellulari Atti del XII Congresso della Societá freniatrica. Ital. in *Riv. sperim. di Fren.*, Volume 31, *T.* 1, 1905), concludes that "the existence of a network of fibrils in the ganglion cell, besides the long fibrils which traverse the cell chiefly at the periphery, must be accepted as conclusively proven. It still remains doubtful whether or not these long fibrils anastomose with each other." According to structure, two types of ganglion cells may be distinguished: Cells containing only a network of fibers, and cells containing long fibrils in addition to a network. The axis-cylinder receives fibrils from the network principally.

That endocellular nets exist has been demonstrated again and again but whether this is always true or that Donaggio's conclusions are certain, is by no means definitely established. Fig. 3 gives a fair representation of one of our own specimens, and as can readily be seen, there is no evidence of an endocellular network. Fig. 4, on the other hand shows one of the horizontal cells from the retina, with an indisputable perinuclear net. We have also seen undoubted net formations in the reticular cells of the tegmentum and corpura quadrigemina. Although the observation of others and that we ourselves have seen would tend to support the view of independence of the axome fibrils from those of the dendrites, still we cannot accept, at least from the evidence offered, the views of Schaffer regarding the fine fibrillary network of the cell body and

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dendrites in contra-distinction to the perinuclear and axonal meshes. He practically rests his case on the Y-shaped branching, which, when we stop to consider that we are dealing with almost ultra-microscopic structures, and therefore exposed to many possibilities of error, are altogether too uncertain to be of such fundamental value.

The relationship existing between cell fibrils and axis-cylinder fibrils is still a matter that requires very great

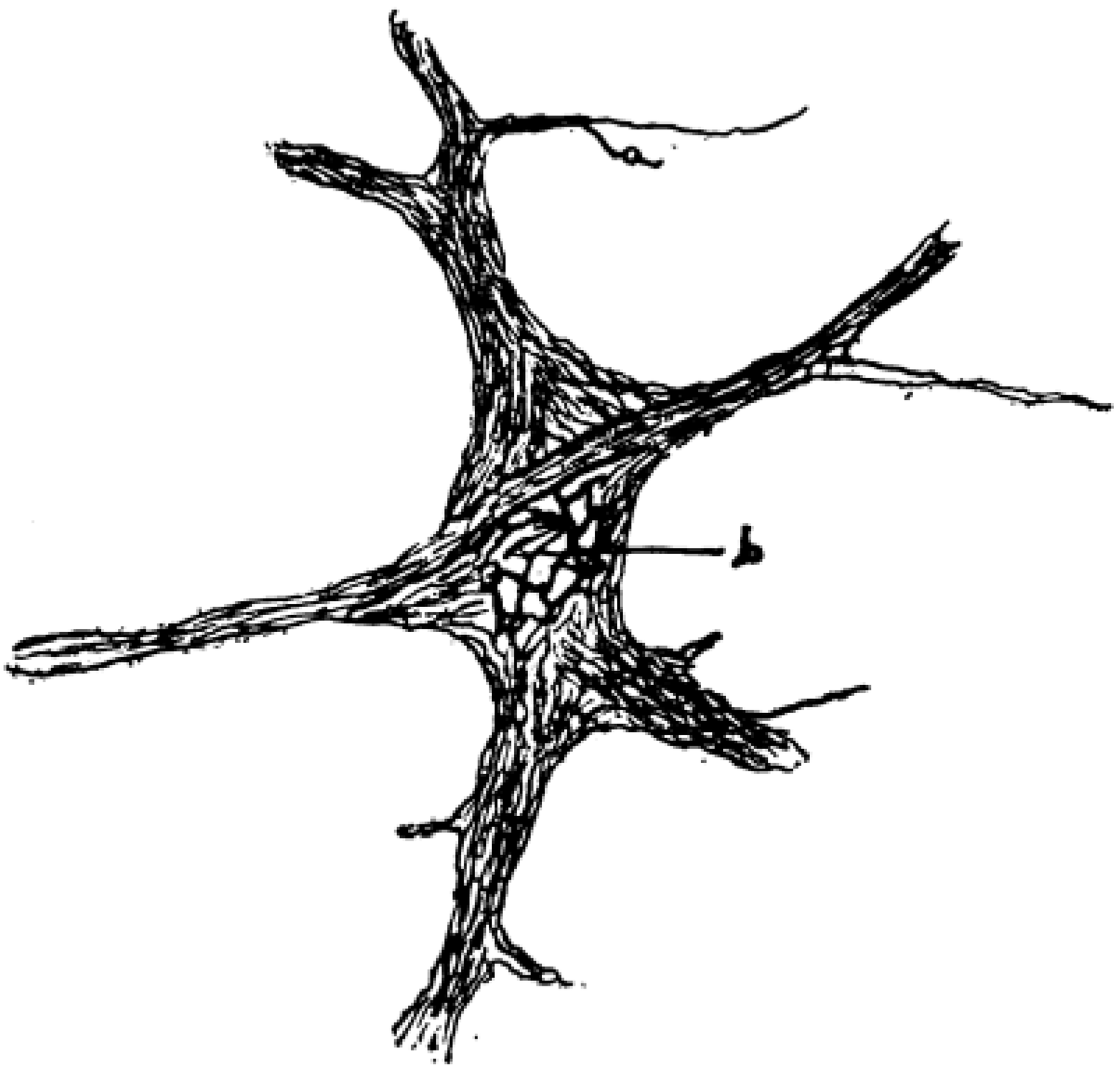

Fig. 4.—Horizontal cell from retina of cat of eight days. A axone; B perinuclaar network. (After Cajal.)

elucidation. Held and Wolff maintain that they have seen fibrils leave the terminations of the axis-cylinders and enter the body of ganglion cells, by means of Cajal's method and Bielchowsky's method respectively. Mahaim studied the nervous system of the cat, the crow and the human subject, by the various Cajal methods. He did not in a single instance observe fibrils penetrating into the cell body. He is of the opinion that Wolff's reticulum is the result of faulty technique; this is not, however, true, for the rela-

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tively thick fibers which Held saw penetrating the cell. The author believes that this is an anatomical "semblance," for the experimental methods show by chromatolysis the marked difference existing between sections of axis-cylinders arising from a cellular nucleus, and sections of axis-cylinders penetrating into a nucleus. The relation between the pericellular terminations and the body of the cells cannot, therefore, be very intimate; and it may be stated that these terminations "are not a part of the cells." The author hopes that it will prove possible by means of appropriate experimental methods to observe degenerated pericellular masses surrounding an intact cellular body.

Bartels, studying the fibrillary structure of the ganglion cell layer of the retina by means of Bielchowsky's fibril method, maintains that he has succeded in demonstrating the presence of fibrils which pass from a protoplasmic process through the cell and into the axis-cylinder process. He also observed other fibrils passing from one dendrite into the other, without traversing the cellular body itself. Finally fibrils were noted connecting the processes of different cells. On the other hand, Vermes (Ueber die Neurofibrillen der Retina, *Anat. Ang.*, Volume 26, Heft 22-23, 1905), who studied the retina of the horse, dog, rabbit, cat, guinea-pig, and also of the human subject by means of the Cajal and Bielchowsky fibrillary methods, does not consider that the continuity of the neurofibrillary layer has been demonstrated. Ramon y Cajal (Trabajos del Laborator de investigacion biol. de la Universidad de Madrid, III., 4, dic. 1904) shows that the differentiation of the fibrils in the cells of the retina begins within the plasma zone from which the dendrites arise, and they begin with the beginning of function; they are begotten by function from the cell protoplasm.

The field in which the question of contact or continuity has been most hotly contested, however, is that of the terminal arborizations of axone at fibrils about the cells.

The recent investigations of Cajal, Bielchowsky, Holmgren, Michotte, and others, show that the neurofibrils ap-

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pearing on the surface of the cell come in contact with it by means of bulbous formations known as the terminal buttons. Bielchowsky, Held and Holmgren believe that the terminal buttons are fibril net-like structures and that the fibrils of the buttons pass into the interior of the cells. But the terminal buttons are in intimate relationship on the surface of the cell through anastomosing fibrils which form a close network. Bielchowsky holds that this formation is identical to that which Held calls the pericellular Golgi nets.

Fig. 5. Multipolar cell with terminal buttons (Cajal method.)

Cajal divides the terminal buttons, or terminal masses, as he calls them, which were discovered by means of his method into two forms, the end club and the transition club. The former come from the vicinity of the cell in form of a fine thread which swells up as soon as it reaches the cell body and closely hugs the cell membrane or the dendrite with its basis. The transition form are fusiform thickenings of certain fibrils, which also become applied to the cell membrane. The end-clubs are found in large numbers at the cell body, sometimes giving it a mottled aspect like a tiger skin. They are never absent at the

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dendrites. Only isolated end-clubs occur at the root cone of the axis-cylinder. VanGehuchten and Marinesco have corroborated (Boutons terminaux et reseau pericellulaire, *Le Nevraxe*, Volume VI.) these observations of Cajal's.

In specimens prepared according to Cajal's method, these end-clubs were observed to be independent of each other as well as of the cell. Cajal's method being an elective nerve fibril method, the pericellular nets, if they exist at all, can only consist of protoplasmic substance. Fig. 5.

Held (Zur weiteren Kenntniss der Nerven-endfüsse und zur Structur der Senzellen. Abh. der K. Sächs. Ges. d. Wiss. Mat. Phys. LI. No. 2, Volume 29, 1903-1904) found nets in the ganglion cells by means of Cajal's method. He disagrees with Cajal concerning the connection of the so-called terminal feet or buttons, and shows by photographs of his preparations that the terminal buttons are in continuity with the protoplasmic substance of the cell body; and that the fibrillary net which exists in the terminal button communicates with that of the cell. Hence the terminal buttons really constitute connecting links between locally remote ganglion cells of the central nervous system, in the longer or shorter path of their axis-cylinder processes. But, as we have said above, Held's views in this matter have not been accepted, neither have they been corroborated by acceptable investigators.

Fig. 5 shows fairly well the formation of these terminal buttons as they appear in Cajal preparations. No single plane, however, such as the drawing must necessarily represent, can give an adequate idea of the enormous number which literally cover the cell and dendrites. This and other preparations which we have carefully studied, seem to bear out Cajal's views very forcibly, in as far as we have been quite unable to demonstrate fibrils passing from the end feet into the interior of the cell. Even successful Bielchowsky preparations, or the illustrations of Wolff, do not establish the continuity question firmly enough in our estimation to make their position sure. One should not forget that we are dealing with very

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minute structures only to be seen with very high magnification, and there is such a dense network of similar structures that it becomes quite impossible to determine absolutely their ultimate destruction.

The more important communications that have appeared during the past few years on the subject of the disposition of the neurofibrils of the periphery of the body must now be briefly reviewed.

Ruffini (Ultraterminal Neurofibrils in Human Motor Endplates. *Rivista di Fathologia nervosa e 'mentale*, Firenze, October, 1900. Vol. V. Fac. X) states that he reexamined his old gold-chloride specimens of human motor endplates with the result that certain details were discovered, which lead him to believe that in man as well as in lower animals a closed system of anastomoses may originate from the motor ramifications (as discovered by Apathy in Hirudinea.) It is quite possible, he believes, that sensory nerve fibrils enter also in connection with this anastomotic system. Ruffini noticed that extremely fine fibrils, of variable length supplied with small "varicosities" sometimes originate from the endplates. These "ultraterminal fibers" seem to terminate after a longer or shorter course within the same muscle-fiber, or more commonly in an adjacent muscle-fiber, either with a varicosity or without one. Occasionally the fibril terminates in a small secondary endplate, from which another thin fibril may take its origin. This goes to show that in man the so-called "motor endplates" are not the real termination of the motor nerve fibers; since other fine fibrils arise from them, the fate of which cannot be definitely determined.

Apathy, in discussing this communication limits himself to some very general theoretical considerations upon the importance of this fact as an argument against the neuron theory. He says that Ruffini's preparations afford proof that nerves do not terminate (or at least, do not invariably terminate—he, for his part, believing that they *never* do) in the endplates of the muscle; just as in the Hirudinea they do not terminate in the "terminal crests" described

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by him and which correspond exactly to the motor-plates of vertebrates. In vertebrates also, and in a very superior vertebrate at that—exceedingly fine nerve paths emerge from the terminal plate, passing in various directions through the muscle-fiber, branching and entering into adjacent muscle-fibers, just as they behave in the Hirudinea.

If it is permissible to judge from experiments made upon animals of such "inferiority," Apathy continues, his observations lead him to predicate the probable ulterior fate of the ultraterminal branches in the following fashion: In part they may pass through some neighboring muscle fibers —in their way as yet unseen—and in part they branch immediately in the interstitial substance between the muscle-fibers, becoming isolated elementary fibrils. These elementary fibrils then pass to the elementary peripheral net which spreads its large and uneven meshes in the interstitial substance between the muscle fibers. But the elementary net receives in its turn other elementary fibrils which come both from other motor plates, and from nonmotor nerves, from the nerves of general nonspecialized sensation (here perhaps from the nerves of muscular sense.) It is another question, which nerves, in vertebrates, are those nerves of general sensation. In the Hirudinea, Apathy was recently able to recognize those nerves in a special type of nerves described by him in 1897, and designated as "sensory tubes."

Dogiel (Der fibrillāre Bau der Nerven End-Apparate in der Haut des Menschen, und der Säugethiere; und die Neuronen-Theorie. *Anat. Anz.* Vol. 27, Nos. 4-5, 1905) describes the termination of neurofibrils in tactile disks, the typical and modified Vater-Pacini corpuscles, the typical and modified Meissner corpuscles, and the papillary bundles of Ruffini, with the assistance of specimens obtained by means of Cajal's neurofibril method from the human skin and from the skin and mesentery of the cat. He concludes that all sensory end-ramifications consist of more or less small-meshed and completely closed nets of neurofibrils, which are placed in a larger or smaller mass of perifibrillary substance. The shape alone varies in the individual end-

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apparatus; round, sometimes curved, small disks of variable diameter (tactile disks, Grandry's corpuscles, swellings at the axis-cylinder ramifications of the typical and modified Meissner corpuscles,) angular scales (human skin, tree-like terminations of sensory nerves of the cutis, mucous and serous membranes, intermuscular connective tissue, tendon); fusiform, club-shaped, round or oval, sometimes flattened, formations (Herbst corpuscles, typical and modified Vater-Pacini corpuscles.) The neurofibril nets are either in direct contact with their surroundings (connective tissue, fibril bundles,) or with special cells (tactile disks) or they have a special sheath. The most marked difference lies in the number of neurofibrils constituting the aggregate of all nets together, in which terminate the processes of a sensory cell, not in the shape of the terminal apparatus. These either reunite by means of individual neurofibrils, or by means of twigs consisting of several neurofibrils; all, together, or a certain portion, forming other end-nets in such a way that the individual terminal apparatus seems to be connected with its fellow (tactile disks, Grandry's corpuscles, leaf-shaped terminations, tree-like ramifications.) All the neuro-fibrils of a peripheral process stand in direct communication with the intracellular net; the perifibrillary substance continues to the process, together with all its terminal nets, where it reaches the maximum amount, as that portion of the cell body which is not differentiated into fibrils. The central process differs in no important feature from the behavior of the peripheral process; the small, club-shaped thickenings, with which the terminal ramifications rest upon the motor cells and their dendrites likewise consist of closed nets of this character. The neurofibrils do not, however, enter into organic connection with the intracellular net or the undifferentiated protoplasm; simply resting immediately upon the cell. Each sensory cell represents a neuron, which communicates neither with other cells of the central nervous system, nor with other units. The neurofibrils belonging to a neuron, form at least three, closed and firmly united nets: the intracellular, the peripheral, and the central net. Cell colonies exist beyond a doubt in the central nervous

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system, meaning that cells of the same type unite by means of their dendrite ramifications. According to their function the closed terminal nets rest either upon the body, or the dendrites, of another colony, or of an individual neuron, or upon non-nervous elements (muscle cells.)

In contradistinction to the Apathy-Bethe neurofibril theory, the author points out that the neurofibrils are to be interpreted simply as products of the differentiation of the nerve-cell protoplasm, and that they serve to build all the terminal apparatus and ramifications, assisted by a portion of the non-differentiated plasm, the perifibrillary substance. The different psychomotor and psychosensory functions belong not only to the neurofibrils, but also to the nerve cell, and all its parts. It is not at present possible to pronounce upon the function and importance of the neurofibrils.

Klomer, working on the crista of the mouse ("Zur Kenntniss des Verhaltens der Neurofibrillen an der Peripherie," *Anat. Anz.*, Nos. 16-17, Vol. 27, 1905,) says the fibrils are seen to approach the cells, entering to a moderate degree into plexus-like ramifications. They then penetrate into the cell at the lower pole, and diverge in shape of a ball, sometimes dividing into branches. The interior of the cell presents a trellis of narrow meshes, which is especially dense directly toward the base of the nucleus. Imperfect staining with methylene blue and Golgi results in the picture of the so-called terminal calices. The fibrils are seen to traverse the cells of the spinal ganglion with a distinct trellis formation, after which they pass to the habenula perforata. Especially in embryos (rodents and mice,) nuclei may be seen very plainly enclosed by very fine neurofibrils. At their egress from the habenula the fibrils diverge at blunt angles. From this point on, fibrils begin to pass in a spiral, rarely in a radiating direction, to the basis of the innermost cells. The others pass in regular flexions of approximately a right angle toward the three outer spiral fiber columns, in such a manner that the fibrils which pass to the first column present one flexion, those passing to

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the second two, and those passing to the third three flexions. From the fibrous strands the fibers run upward in a curve to the bases of the outermost cells, and enter the cell, forming a very fine trelliswork in the basal portion especially. Free nerve terminations could not be made out at all. The author points out that the behavior of the nerves varies surprisingly in the crista aud macula of different animals. The neurofibrils in the Pacinian body are rather numerous, the perifibrillary substance staining deeply and forming a distinct plate at the peripheral end, under which lies a small trellis of neurofibrils with distinct meshed formation. Concerning the effectory terminations, the author assumes a similar structure, supporting his views by the description and illustration of motor endplates and the intracellular ends of the glandular nerves from the skin of amphibia. The author was unable to discover special terminations in the myocardium, the fibrils invariably returning to form strands of parallel fibers, however fine they may have grown before. Neurofibrils do not occur anywhere without being accompanied by their matrix, the perifibrillary substance, which may be either the protoplasm of a nerve cell, of a receptory or effectory cell. Both plasma and fibrils are capable of conducting, perhaps to a different degree, just as special contractile fibrils still occur in contractile protist plasm.

Schiefferdecker (Nerven und Muskelfibrillen, das Neuron, und der Zusammenhang der Neuronen. *Sitzungsbericht der Niederrheinischen Ges. fur Natur-Heilkunde*, Bonn, December 12, 1904) observed that not only do the fibrils increase in size during the contraction of a muscle fiber, but also the strips of sarcoplasm between them, the latter contracting more strongly than the former. Accordingly the sarcoplasm can no longer be considered as an indifferent substance in the muscle fiber. The conditions existing in the muscle fiber resemble those of the nerve fiber and nerve cell. Here neither the fibrils nor the plasm serve independently for conduction; but the entire nervous activity is to be interpreted as a chemical or chemicophysical process, resulting from a mutual action of the plasm upon the fibrillary substance. The chemical interaction increases in direct ratio

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to the surface of the fibrils. Accordingly, the intensity of the process constantly decreases from the cell-body toward the nerve termination. The author suggests a number of new terms. The indifferent protoplasm becomes "myoplasm" as soon as the cell is plainly recognizable as a muscle cell, and it gradually matures into "sarcoplasm" with the formation of fibrils. In a corresponding fashion it is permissible to speak of successive "protoplasm," "neuroplasm," and "myoplasm," in the evolution of nerve cells. To the axoplasm and the axofibrils of the axis-cylinder correspond the teloplasm, and the telofibrils in the nerve termination.

The alterations caused by experiments and by disease have laterly been carefully studied. These investigations have been directed mostly along two lines, namely: the changes occurring in the neurofibrils within the cells under abnormal conditions and those which take place in the peripheral nerves after resection and during regeneration. Marinesco (*Revue Neurologique*, p. 5, 1905) studied by Cajal's fibril method the cells of the twelfth neuclei after cutting the nerve, and noted during the first stages of reaction and reparation disappearance of the fibril network, the fibrils arranging themselves in bundles or in streaks. Later the net makes its reappearance centrally around the nucleus, with simultaneous thickening of the fibrils (increase of the reduction capacity of the fibrils.) Marinesco saw similar pictures in the spinal ganglion cells after section of the sciatic in rabbits, only in this case the changes occurred earlier and disappeared later.

According to Cajal, in the hungry, resting hirudo and in resting animals while digesting, the fibril apparatus is very thick. The fibrils are thin when one warms the animals and immediately after they eat. If the animal starves the fibrils are destroyed and in part reabsorbed.

Tello (Trabajos del Laborator de investigacion *Biol. de la Universidad de Madrid*, III, 2-3, p. 113, 1904) says that in the lizard, during its winter sleep, the disposition and the number of fibrils are very unlike those in the lizard during its activity.

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In the hibernating adder and the lizard, the fibrils in the cell are enormously thick. They stretch themselves out in the spring to extraordinary fine threads, and all transitional states may be seen in one cell. One never fails to see in these animals the passage of fibrils out from the cells; they go only in the dendrites and the axis-cylinders.

It would seem that in these lower vertebrates, as in Hirudinea, the perinuclear fibril apparatus is the most mighty. Fig. 6.

Ramon y Cajal ("Variations Morphologiques du Reti-

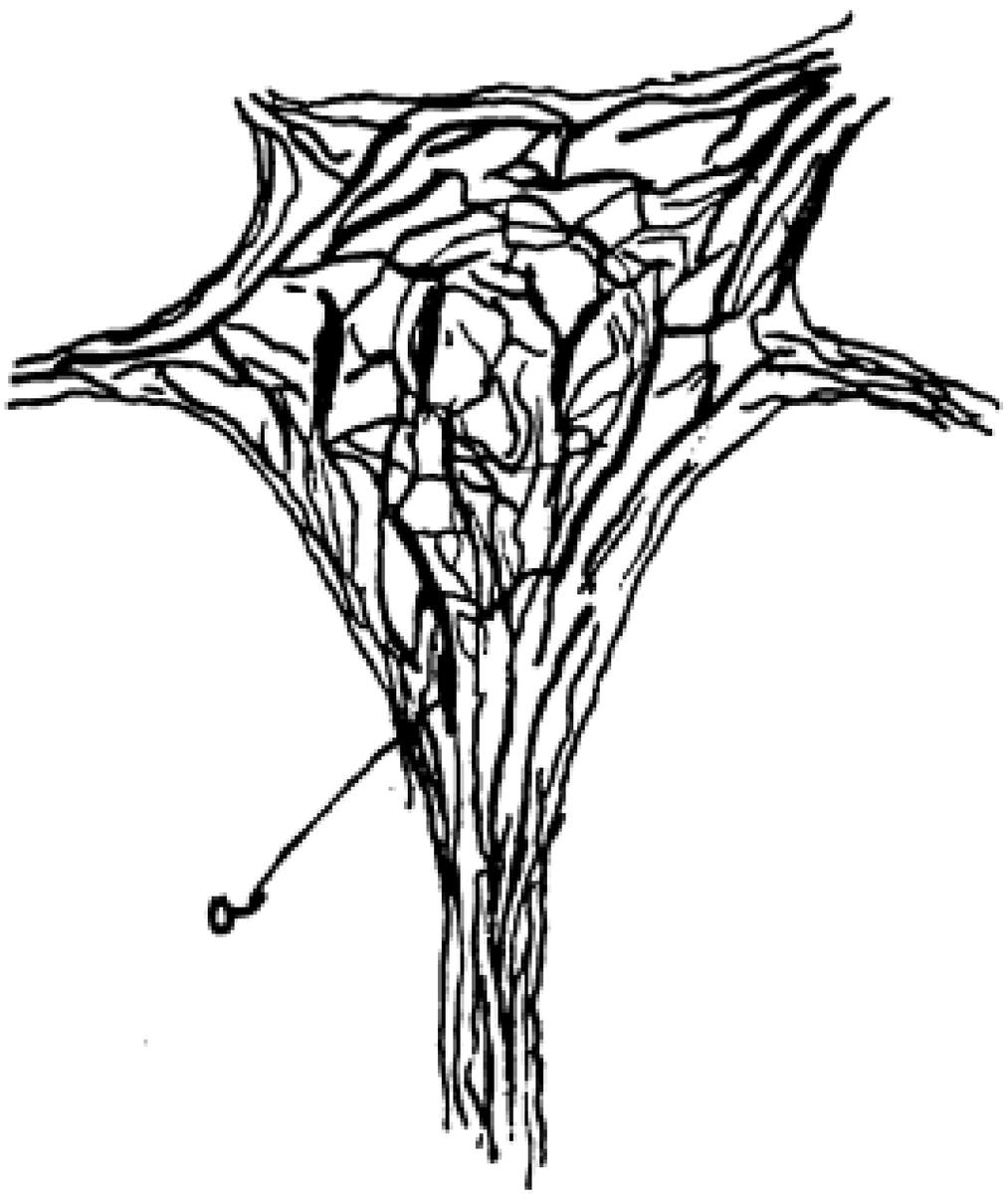

Fig. 6.—Funicular cell from medulla of rabbit; death by rabies. A swollen neurofibril. After Cajal

culum Neurofibrillaire dans certains Etats Narmaux et Pathologiques," *Comp. rend. de la Soc. de Biol.*, LVI, 8, p. 372, 1904) shows that the fibrils do not all behave in the same way. The ganglion cells in the cord of the hibernating lizard show definite changes in the neurofibrils when exposed to heat. They become finer, more abundant and lose their bundle formation. The terminal buttons remain unchanged.

The condition of the neurofibrils in the brains of cases

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of general paresis have been studied considerably. Jansky ("Neurofibrils Under Normal and Pathological Conditions," *Casopais lék.*, 1905) shows that the structure of the neurofibrils is definitely altered in progressive paralysis. The findings consist in hypertrophy, varicosity, granular transformation, and refraction of the fibrils, more especially in the smaller ganglion cells. Nothing of special interest could be made out in a case of senile dementia; while in another case of catatonic dementia præcox of several years' duration the histological examination yielded the following results only: A distinct, diffuse chromatolysis seen by the Nissl stain, the silver impregnation showing apparently normal conditions. The same striking difference was observed in another case of dementia, in which also a marked chromarolytic change in the cells accompanied an unaltered structure of the fibrils. Advanced alterations with breaking down of the chromatic substance are thus seen to be in no way dependent upon destructive disturbances of the fibrils, nor to determine the latter, since the two histological elements stand in no demonstrable relationship to each other.

Jansky's findings are not in harmony with those of Dagonet (La persistance des neurofibrilles dans la paralysie générale, *Comp. rend. de la Soc. de Biol.*, Vol. 57, 1904.) He examined the brains of three patients who had died of general paralysis, using the Ramon y Cajal method. Portions of the cortex taken were from different regions (parietal lobe, central and third frontal convolutions, anterior portion of the third frontal lobe, occipital lobe, cerebellum, vermis, oblongata, and cord.) The extracellular fibrils were found to be universally preserved in all portions, including those in which the brain substance presented marked changes, the fibrils being normal in character. The intracellular or secondary fibrils could also be plainly seen and demonstrated. In the most marked atrophic cells the fibrils formed undulating bundles around granular masses. There was no granulation or pigmentation of the fibrils. The fibrils of the Purkinje cells and cord cells were equally well preserved.

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On the other hand, Marchand (Lésions des Neurofibrilles des cellules pyramidales dans quelques maladies mentales, *Comp. Rend. de la Soc. de Biol.*, Vol. 57, 1904) has found very distinct alterations. The neurofibrils were examined according to the Ramon y Cajal method, in the pyramidal cells in the left ascending frontal convolution, central portion, and also of the second left frontal convolution, central portion, in the following diseases: Paralytic dementia (two cases,) senile dementia, dementia præcox, idiocy, acute delirium, insanity, and paranoia (one case.)

In the third case of progressive paralysis the lesions of the neurofibrils were most marked in the cells lying close to the meninges. Around the nucleus the neurofibrils were seen to disappear. A rather diffuse but distinct alteration of the fibrils around the perinuclear zone, consisting in atrophy of the protoplasmic processes, with disappearance of the fibrils, was observed in senile dementia. The lesions of dementia præcox were less extensive, presenting numerous pyramidal cells with normal fibrils side by side with cells whose fibrils were partially destroyed. In idiocy and microcephalus the cells were observed to contain many fibrils, but were small and had few protoplasmic processes. The lesions of insanity and acute delirium were rather similar; an irregular atrophy of the primitive fibrils, beginning around the perinuclear zone and spreading irregularly toward the sides. The amount of fibrils was found to be normal in paranoia.

Ballet and Laignel-Lavastine (*Revue Neurologique*, 1904) have likewise observed certain modifications of the neurofibrils in the cortical nerve cells of a patient having general paralysis, which were not found in the cortical cells of three patients who had died of pulmonary tuberculosis. The modifications of neurofibrils which might be expected *a priori* in general paralysis are not visible in all the cells. Like Marinesco, they noted the marked contrast between the fragmentation, granular transformation, and rarefaction of the fibrils of the medium and small pyramidal cells on the one hand, and the integrity of similar fibrils of the large pyramidal cells on the other hand. In most of the

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small and medium pyramidal cells the more or less clear perinuclear region is devoid of fibrils. At the base of the prolongations the fibrils are often torn asunder, wavy, or reduced to black points—some of which seem to be rods as the microscope is being adjusted. These configurations are found in a few large pyramidal cells also. Generally, however, only a rarefaction of the fibrils in the vicinity of the nucleus is visible.

Finally, it was demonstrated that in control brains the fibrillary network surrounding each cell is much richer and denser than in the brain of a general paralytic. From this point of view it is necessary to guard against error by comparing sections of exactly the same tint only, since silver impregnation increases in intensity as fields lying closer to the margins are examined.

Marinesco (Lesions of the neurofibrils in certain pathological conditions, *Comp. Rend. de la Soc. de Biol.*, 1905) believes the majority of those pathological conditions in which the chromatophil substance of the ganglion cells is markedly altered, likewise present corresponding lesions of the neurofibrils. The author was able to demonstrate such lesions in acute myelitis, purulent meningitis, foci of softening and atrophic convolutions; the neurofibrils showing variations differing in degree, imperfect staining capacity, diminution in size, complete atrophy, granular degeneration, or thickening and disintegration. In hemiplegia and paraplegia the pyramidal cells present secondary changes analogous to those following division of the axis-cylinder in peripheral nerves. Where the disease runs a rapid course, the neurofibrils likewise undergo rapid alteration. The primary seat of the lesion is also of importance, the neurofibrils rapidly degenerating and entirely disappearing in subcortical lesions and in lesions of the internal capsule. The first neurofibrils to be involved are those in the vicinity of the nucleus; the neurofibrils of the processes following in grave lesions only.

Parhon and Papinian (Note sur l'altération des neurofibrilles, etc., *Comp. Rend. de la Soc. de Biol.*, 1905.) The

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neurofibrils of the ganglion cells of the brain were found to be more or less altered in patients having pellagra with marked cerebrospinal symptoms. As a rule the neurofibrils of the small ganglion cells presented slight changes only, while they were almost entirely absent in large cells, such as the pyramidal cells. The nucleus also was markedly altered in the large pyramidal cells. The cervical portion of the cord was more seriously affected than the lower portions, and the root cells worse than the cells of the columns. The anterior horn cells were most deeply involved, presenting alterations resembling those of the pyramidal cells in the zone of Rolando.

Gentes et Bellot (Altérations des neurofibrilles des cellules pyramidales de l'écorce cérebrals dans l'hemiplégie, *Comb. Rend. de la Soc. de Biol.*, 1905) state that in cases of hemiplegia, where the pyramidal tract has been destroyed by the hemorrhage, a number of normal pyramidal cells are found side by side with cells whose fibrils are diminished in number, thickened, fragmented at the periphery, or entirely destroyed, especially in the central portion of the cell. No alteration was observed in a case where there was only a compression of the pyramidal tract.

Wimmer (Investigations concerning the neurofibrils in the cerebral cortex in pathological conditions, *Hospitalstidende*, No. 30, 1905) examined cases of general paralysis, delirum tremens, senile dementia, idiocy, and also one case of chronic trional intoxication by means of the Ramon y Cajal method, with Bokay's modification. In all these cases he observed a more or less marked degeneration of the fibrils in the pyramidal cells, especially in the small and medium-sized cells. A form of degeneration characteristic of each individual disease could not be demonstrated.

Bielchowsky and Brodmann (*Journal of Psychology and Neurology*, V, 1905, p. 173), in discussing the changes in the fibrils in pathological conditions, say that the scanty histopathological examinations chiefly consider the qualitative alterations in individual cells only. These procedures, however, are capable also of furnishing reliable data for the

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quantitative defects caused by pathological processes, and moreover they afford a view of the nervous fiber belt situated between the cells. The author's findings were obtained exclusively by means of the Bielchowsky method. For the purpose of obtaining control specimens they began by examining definite areas of three normal brains, followed by the examination of exactly the same convolutions in seven pathological cases of an absolutely typical clinical course (dementia paralytica, dementia senilis, and idiocy). The results of their observations are proof positive of the reliability of the Bielchowsky method, the authors attaching special importance to the following points:

1. With reference to the normal histology of the cerebral cortex, the silver image is capable of completing and improving the customary parenchyma methods in various ways. The entire cortical structure appears much better differentiated in regard to the formation of fibers as well as of cells. (*a*) The nervous fiber-felt is much denser in the outer cortical layers, notably the first, second, and third layers, than in the medullary sheath specimen. Besides the medullated fibers, exceedingly numerous nonmedullated elements, especially in ramifying protoplasmic processes of the ganglion cells, participate in its formation. (*b*) The shape of the cells is very manifold, on account of the large number and great extent of the dendrites which are represented. The Bielchowsky method permits the differentiation of new types of cells, and based upon this, a finer differentiation of the layers in various segments of the convolutions. (*c*) The fibrillary structure of the cells permits the division of cell types hitherto considered as homologous, for instance, various forms of giant pyramidal cells. (*d*) The last-named properties result in greater variability of the cortical arrangement in general within individual layers as well as entire cortical areas.

2. For the pathological histology of organic psychoses, the fibril preparation furnishes results applicable in the uniform valuation of all nervous components. Pathognomonic characteristics of individual elements of the cortical parenchyma cannot be recognized in the fibrillary picture.

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(*a*) As the principal characteristic of progressive paralysis, the parenchyma presents remarkably profound alterations in all the cells even to the disappearance of entire cellular layers with relatively fair preservation of the fibrous constituents. This circumstance is important for the functional valuation of the cell, the significance of which has of late been underrated.

The cell of general paresis is generally characterized by the early and extensive destruction of the processes and by the resolution of the fibrils, with temporary persistence of individual fibers in the body of the cell. The fibrous felt is markedly thinned out, especially in the finest elements.

(*b*) In senile dementia, in contradistinction to general paralysis, the outer shape of the cell with its dendrites is well preserved, as are likewise the cortical layers. The cellular structure is characterized by enlargement and bunching of the fibrils. The intercellular loss of fibers is less pronounced and affects coarser and finer constituents more uniformly than in general paralysis.

(*c*) In idiocy the shrunken convolutions presented radcally different findings. The arrangement of the layers, the forms of the cells and the fibrillary structure were quite atypical. The number of fibers and cells was notably decreased.

Studies of the fibril changes in peripheral nerves after resection and during regeneration has produced two groups of observers who combat each others' views almost as bitterly as the opponents and defenders of the continuity theory. Waller established his law of regeneration a long time ago. But even in the early eighties Vulpian and Phillippeaux claimed to have seen axis-cylinders developing in the peripheral ends of severed nerves where they considered there was absolutely no chance of communication between the central and peripheral stumps. Since then their observations have been corroborated by Modena, Béthe, Howell-Huber, Marinesco, Van Gehuchten and others. These latter, by means of the various silver methods have found

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innumerable fine nerve fibrils in the peripheral stumps where there was no chance of communication with the central portion. These fibrils develop from the protoplasmic bands which arise from the cells of the sheath of Schwann, and can be seen as delicate fibrils lying in these bands. This view has been further supported by the embryological studies of Béthe and Schaffer who claim that the axones of peripheral nerves are not outgrowths of the anterior horn cells but develop independently with the bands of cells from the neural ledge which ultimately forms Schwann's sheath. Unfortunately for this view however their claims have been completely upset by the recent brilliant experiments of Harrison, to which we will refer later on.

This manner of regeneration has been termed autogenous and has become very popular with the rank and

Fig. 7.—Psotoplasmic band containing tous nuclei. and in the interior can be seen fibres crossing or fusing at different points of their course. After Marinesco.

file of neurologists. A certain number of investigators, including Stroebe Vanlair, Lugaro and Cajal vigorously deny this manner of regeneration. Their studies have demonstrated the central outgrowth of the fibres through the intermediary connected tissue into the peripheral stump and then on to their terminals. The fusiform cells and protoplasmic bands in whose vicinity the newly formed fibres are found to perform either nutritive functions or else are endowed with certain phagocytic properties for the absorption of the broken down sheaths and fibres. Cajal has ascribed to them certain properties which he calls chemiotactic in that they have the power to attract the outgrowing fibrils in their direction.

Marinesco (Journal f. Psychologie u. Neurologie, Bd. VIII, Heft 3-4, 1906) after further researches has recently been obliged to completely modify his views on this subject. He finds he can no longer support the claims of Béthe, et al. Use of the Cajal method has convinced him that

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while there are many terminal masses and globules in the central stump there is always a large number of fine fibrils, a veritable plexus which pushes swiftly through the intermediary mass of tissue into the peripheral portion of the nerve. He contends that serial sections show diminished activity in the process, the further away we get from the central portion, (a fact also observed by Bethe,) and that there are always fibrils in the intermediary tissue between the two stumps. In concluding, however, he rather spoils his own cause by citing certain cases where after tearing out the central portion, fibrils could be demonstrated in the peripheral stump despite very decided atrophy of the corresponding anterior horn cells.

Our own observations have led us to conclude that one should be very cautious in accepting the various descriptions of alteration in the neurofibrils. That alterations do exist in pathologic states is probable enough to be almost certain, and it is only against the tendency to accept too readily the attempts to classify them that we advise. This seems specially true of the Cajal method, depending as it does upon the well-known, rather uncertain, powers of penetration which silver salts possess. In the most successful preparations by this method there are always two zones, where the staining is absolutely unsuccessful; even in the middle zone, where the stain is most successful, all the cells are not impregnated regularly and evenly, and we have found not infrequently badly stained cells in normal preparations which resemble quite closely some of those described as pathologically altered.

Marinesco has given elaborate descriptions of the changes in the neurofibrils after tearing out the hypoglossus of rabbits. His records show changes from the forty-eighth hour up to thirty days, whereas our own preparations of the hypoglossa nucleus fail to show even at the end of the fifth day the changes he describes as having already taken place at the end of the thirty-sixth hour. We can corroborate his observation that only the anterior external group is affected, but the only alteration in the fibrils themselves seems to lie in

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a paler and more delicate stain. They no longer possess the dark, sharply differentiated outlines of the neighboring cells, and the contrast is quite marked. We are unable to see that granulation and loss of structure, he so graphically describes, or a tendency of the fibrils to arrange themselves in bundles.

The Bielchowsky method, on the other hand, is much more logical in that it gives us a more constant stain of all the elements in the section, and the modifications have rendered it simple enough to permit most workers to become conversant with and rely on it. But here also there is need of much corroboration before the evidence can be accepted as final.

The new teachings ask us to imagine a fiber without a cell—a thing which we cannot do unless we give up the cellular theory.

Although there seems to be a necessity to modify the neuron theory, nothing has yet been done to cause it to be abandoned. In fact, some of the later work of Cajal, carried out according to his new method of staining, has strengthened the position of those who adhere to the neuron theory. For instance, Cajal and Retzius have both demonstrated the existence of a neurofibrillary network in the ganglion cells of vertebrates. Cajal maintains that these neurofibrils remain in the ganglion cells and their processes; they do not leave it as claimed by Apathy and Bethe, they do not emerge freely, they do not form connections with each other and accordingly they do not form a true network in the dotted substance, but merely an intimate interlacing. Cajal, Retzius and other investigators maintain that the neurofibrils in invertebrates belong to the cellular structure of the ganglion cells and their processes, being formed within them *in situ* instead of having migrated into them from without as described by Apathy and Bethe. If this is so, and at the present time it must be accepted, it tends materially to strengthen the neuron theory, for no proof has been furnished, apart from their mere existence of their extracellular appearance, and their seeming endlessness.

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That the neurofibrils are the actual and only conducting element of the nervous system has been assumed, but the assumption is based upon the correctness of the evidence furnished by Apathy, Bethe, *et al.*, and has been contradicted from most reliable sources.

Even though it is granted for the sake of argument that there is an intercommunication of the neurofibrils belonging to the motor and sensory system by means of networks in the cell-body, this is not adequate ground for asking us to abandon the neuron theory. There is no proof whatsoever that the fibrils have the function of conducting. That is an assumption just as the existence of a fibrillary acid by Bethe as the condition of nervous conduction is an assumption.

On the other hand, the neuron theory does not get all its support from histological study of vertebrates or invertebrates, by any means. As we shall point out later, it receives some of its strongest corroboration from embryology. But even though it were so dependent there would still be much histological evidence in support of it. For instance, the relation of the collaterals in the spinal cord, the free terminations of which can readily be demonstrated, the relation of the end-baskets around the Purkinje cells, and the granular cells of the cerebellum which Michotte (*Le Névraxe*, Vol. VI., No. 3) has particularly studied, many of which we have previously mentioned, and the results of study of the retina. Cajal has been able to demonstrate in the retina fibrillary network within the cell-body, also the anastomosis formation of the fibrils within the dendrites, but he was not able to see the anastomosis between two ganglion cells which Dogiel and Graef described.

One of the strongest supports of the neuron theory has been the teachings of embryology as set forth by His and his school. Those who oppose this theory look upon peripheral nerve fibers as the product of innumerable cells arranged one after another in chains which remain in fully developed nerves in the shape of Schwann's cells (Dorn, Apathy, Bethe, Schultze.) But a recent work of R. G.

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Harrison of Baltimore (*Sitzunsber. der Niederrhein. Ges. f. Natur. Heilk. zu Bonn, 1904,*) which has been received most favorably by embryologists and anatomists, gives the most unequivocal support to His' teachings that every nerve fiber is the outgrowth of an individual ganglion cell. Harrison shows, from many observations on the larvæ of amphibia, that Schwann's cells, like the spinal ganglion cells, are of ectodermal origin and come from the so-called ganglion ledge of the neural canal. When this ganglion ledge is removed from the body at a certain stage of embryonal development and then the nerves develop in the normal way, it gives incontestable evidence that Schwann's cells as well as their cells of origin have no participation or significance in the formation of axis-cylinders. In other words, the peripheral spinal nerves may develop when the sheath-cells are entirely absent. This idea Harrison believes is substantiated by the fact that after complete extirpation of the ganglion ledge he has observed the development of naked fibers in the periphery.

His conclusions are: The axis-cylinders of motor nerves develop in a normal way in embryo frogs in which the development of Schwann's cells are prevented by cutting out early the ganglion ledge. The nerve consists in these cases of naked fibers which may be followed as such to the ventral portion of the thigh and tail muscles.

The sensory nerves of the tail in Triton larvæ, naked ramifying fibers, which, from their origin in the posterior cells, and the cells of the spinal ganglia to their ending, show no Schwann's cells. The latter are to be seen for the first time only after fibers have formed; they proceed gradually from the center toward the periphery, as is evident from a comparison of different stages, and also from direct observation of the fins of living frog-larvæ.

The Rohon-Beard's posterior cells of the frog embryo consist of early protoplasmic formations, which gradually stretch themselves under the skin to nerve fibers. The termination of nerve fibers so constituted consists of a thickening with fine pseudo podii prolongations. The nerve

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fibers are first of all simple, later they intertwine and eventually through interlacing with neighboring cells constitute a plexus. From the beginning to the end there are no Schwann's cells in these nerves. From which it appears that nerve fibers come exclusively from nerve cells.

Carrying the experiments a step further, Harrison excised in young embryo of *Rana sylvatica* and *Rana palustra* the ventral portion of the neural tubes from the cells of which develop the neuraxons of the spinal motor nerves. He left the neural ledge from which develop the spinal ganglia and sheath-cells intact. The result was that the latter developed normally, but of the former not a trace. Thus he proved incontestably, and in a way reflecting the greatest credit upon his insight and ingenuity, that the motor neuraxons are processes of the anterior horn-cells, and that the sheath-cells cannot by themselves originate these fibers.

The one thing that is needed by the opponents of the neuron theory is to show the transition of a sensory, centripetal impulse, to a motor centrifugal tract without the intermediation of a ganglion cell. If they could do that their claims would be established. Whether they first go in or come out of the cell, whether the elementary trellis formation is originally extracellular or intracellular, whether the fibrils are at all interrupted at Ranvier's nodes, or whether there is a free peripheral termination, are all matters of trivial importance compared with this, for then the neuron theory would lose its applicability and usefulness to the problems of physiology and histology.

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ALCOHOL IN THERAPEUTICS.

By C. H. HUGHES, M. D.

St. Louis.

THIS important subject received much and significant attention at the late dinner of the Dominion Alliance against Alcohol of the British Medical Association, Mr. Victor Horsley delivering one of the principal addresses. Our friends, Murdock Cameron, of Glasgow, and Henry O. Marcy, of Boston, also Professor Woodhead of England, being equally forceful in their presentation of the indictment against alcohol as a beverage and too common therapeutic agent.

Sir Victor Horsley took very strong ground in favor of lessening the use of alcohol in connection with surgical operations, and Professor Woodhead, of Cambridge University, was equally pronounced in his opinion that good would result from using less alcohol in the practice of medicine.

They assert that a great change has passed over both branches of the medical profession toward alcohol as a drug. Horsley stated that when he was a student it was the custom to give alcohol freely to each patient before the performance of an operation. Since the discovery by Lord Lister of the principles of antiseptic surgery this custom has largely died out, and a year ago a well-known practitioner said he had not used alcohol in seven years in general practice. It was formerly the custom to give patients alcohol also after operations, but its place has been taken by other drugs better adapted to serve the purpose in view. Professor Woodhead's testimony was equally emphatic and satisfactory as to the progress made in the same direction by British medical practitioners. Men who formerly looked upon alcohol as necessary in the treatment of various diseases

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are now satisfied that it produces an injurious effect on the patient's power to resist disease. Men who have made laboratory investigations regarding the actual value of alcohol as a medicine have generally come definitely to the conclusion that its use tends to lessen rather than increase resistance to disease.

Dr. Marcy, of Boston, whose experience dates back to the time when he was an army surgeon during the civil war, and Dr. Murdock Cameron, of Glasgow, added the information that hot water or milk and soda had been used with advantage, instead of the alcohol formerly given so freely to patients about to undergo surgical operations. By hospital statistics Sir Victor Horsley showed that in seven great London hospitals the annual expenditure on alcohol had decreased in forty years from forty thousand to fifteen thousand dollars, while the annual expenditure on milk had in the same interval increased from fifteen thousand to forty thousand. He showed also that during twenty-five years in the Royal Infirmary at Salisbury the annual expenditure on alcohol had fallen off from fifteen hundred dollars to thirty-five dollars.

If alcohol is harmful as a drug in general, it is worthless as a drink. The marked and sometimes fatal affinity that alcohol has for the water of the tissues and cerebrospinal and interventricular fluids and the fluid bathing the nerves and neurones, ought to suggest the the danger of its extensive use, even when largely diluted in readily eliminatable form, as in beer and wine and highballs, though when well chaperoned on its way through the system to the emunctories with large quantities of water, its harmfulnes of courses, is thereby diminished.

Yet it is always a menace to organic integrity and vasomotor stability, in therapeutics and should be prescribed sparingly and cautiously with these facts in view; under the wisest of skilled physiological precautions, in hands of utmost therapeutic wisdom, and while alcohol increases thirst and promotes elimination when largely diluted, as in ale and beer, or with plenty of water, it

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nevertheless clings tenaciously to the organism and only the largest quantities of water can dislodge it in cases of transient alcoholic toxhemia. This fact should always be considered in administering it therapeutically and especially when contemplating its use as a beverage. This fact generally contraindicates its prescription. It tends to parch the tissues and impair tissue and viscera functions.

Regarding alcohol in any form as an habitual beverage, wisdom dictates abstention from its use as an exhilarant, in the light of the now well-known perverted physiology and pathological anatomy resulting from its use. It is in the main a patho-physiological and anatomical mocker, as it was long ago wisely pronounced before the discovery of its vasomotor paralytic powers, its arteriole, hepatic and other viscera and tissue destructive influence.

The mentally and morally degenerating influence of habitual excessive alcoholic indulgence, though now a matter of common observation, has also long been well known to the medical profession since the researches of Morel called special attention through close observation of alcoholized individuals and their descendants, to the vicious evolution therefrom and therein of the neuropathic diathesis and its destructive train of fatal results to posterity, through which so many of the epilpsias, imbecilities, idiocies, and insanities are engendered.

We now know too sadly and too well through confirmatory observation, of the psychic neurone depressing power of persistent and excessive alcoholism, to look lightly upon the careless use of this potently harmful nerve center poison. The alcoholic multiple neuritides, affecting the peripheral nervous system, through morbid changes, also at their centers, added to our knowledge of the alterations of the psychic and psychic-motor neurones and the changed quality of the ventricular fluids under its prolonged use, admonish us to caution. Its potent influences too in counteracting the poison of the crotulus on the central nervous system is significant of its sometime therapeutic power.*

*The neuritides of alcohol are probably due to its power of abstracting the fluid surrounding the axis cylinder beneath and nourishing the neurilemma.

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The insidious hold that alcohol takes of the psychic neurones and all the pathologic changes demonstrated by Bevan Lewis and his co-workers, predecessors and followers, carry an especial caution to scientific observers and thinkers in the domain of practical medicine, causing them to beware how alcohol's fatal potency for harm to the organism may be established through its fatal instrumentality, as that of opium, has been, largely through indiscreet, careless, incautious, indiscriminate prescribing, especially by druggists, and the reckless, thoughtless or venal refilling of prescriptions by crafty pharmacists, etc. The unfortunately and often fatally endowed man and woman with the inborn or morbidly acquired aptitude to fatal alcoholic excess is always with us, and, as it would be harmful to ask such a one to take even a sip of wine, as is often done at social parties and at the family table, it is imperative upon us to be especially cautious in such cases as to the giving of alcoholic medication in our prescriptions.

Several thousands of years have elapsed since it was said by the wise man of holy writ, "Woe unto him that putteth the bottle to his neighbor's lips," yet the treating habit continues, the insidious beer canning, making incipient inebriates, is growing, light wines are considered harmless habitual beverages, to be taken at meals *ad libitum*. We prescribe the alcoholics verbally and undisguised, our banquets are now much more moderate in the serving of alcoholics, yet continue to serve alcoholic drinks first and coffee last; whereas the rational way would be to first offer the exhilaration of coffee and tea and offer, if they offer them at all, the alcoholics last. The better way would be to omit the alcohols altogether or serve them on a sideboard or from the bar to those whose already formed habits are such that their psychic neurones can not be brought into convivial action without the coursing of the poison through their circulation to toxically arouse the otherwise dormant brain activity. Set them only for those who, by force of long alcoholic imbibing habit must have the toxic scourge, or think they must, to bring their psychic neurones into vivacious action.

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It was not "Luke the good physician" who in the earlier Christian days prescribed "a little wine for the stomach's sake" of *Timothy, but Paul who himself often needed a physician. St. Paul in the cerebrasthenic periods of his glorious but often over-strenuous life, probably found in the wine of his day, much of it unfermented, a grateful relief to his cerebrally dyspeptic stomach and a restful diversion from his over-anxiousthought and duty well-done toward God and man. But, like the cruel crucifiers of his Master, he knew, not what he did to posterity through that brief, uninspired therapeutically wrong admonition to his suffering colleague in Christian work, although the advice sprung from a natural and very common human impulse to help heal an afflicted associate by remedial suggestion. This advice to Timothy, his brother in Christ, has been quoted and acted upon millions of times, both by the saintly and the ungodly, to the harm of mankind, regardless and ignorant of the inherent oinopathic proclivities of many with whom the alcoholic road once taken, even for relief of disease, and sometimes at the communion, is never forsaken. It is not long since a man of New York, clad in the holy vestments of his sacred office, more thoughtless and less pious probably than Paul of Corinth, but a counsellor in the name of the blessed Christ, invoked in His holy name the blessing of God on moderate daily alcoholic beverage drinking, the end whereof is usually moral as well as physical and mental degradation, degeneration and ruin through ultimate demonstrable damage of brain and other organic tissues and viscera.

The medical profession in times past has done its share in this form of unwise counsel along with the clergy and the rest of mankind. Let it do no more of it, but admonish

*It does not appear in biblical record that Timothy was an oinopath or that he ever became a dipsomaniac in consequence of St. Paul's advice. He was not so fatefully endowed in his cerebro-psychic centers, nor was Paul. But what if either had been. Many a gifted Divine has gone the road to ruin from following Paul's advice to Timothy and that other biblical encomium on wine that "it maketh the heart glad." Wine indulged in as a daily beverage has saddened the hearts of millions and maddened the minds of men since this fatal encomium was uttered. Paul's consent to the stoning of the protomartyr Stephen, which through remorse contributed to bring about his own stoning conversion, could have worked no greater harm to mankind than that consented to but repented act of the good apostle.

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and practice in the light of later observation and scientific teaching concerning alcohol used as a beverage. The oinopathic diathesis confronts us as never before and the latent drink-crave stricken, needs from us as much consideration as we would give the "pestilence that walketh in darkness" to destroy.

Bacchus will reign the supreme monarch over the lives of many men long after we shall have gone from earth, but let us not promote the perpetuation of his power over the human brain and mind by friendly aid and counsel against our knowledge and conviction, revealed to us by experience and the unerring teachings of science, as to alcohol's morbid destroying marks made on the human anatomy.

We are bound to consider the unfortunate psychopath, to whom alcohol in quantities which would not markedly impress another, acts as an immediate poison to the brain, developing the instability of delirium and even of marked insanity. He astonishes his friends who are imbibing with him by becoming crazy drunk within a few minutes after taking a few social glasses. This is the man from whom his companions wish then to get away, but often cannot, until some untoward denouement happens to require his restraint. This is the sort of oinapath in whom a little liquor is a dangerous thing and is diagnostic of the psychopathic diathesis, causing abnormal conduct, unnatural to the same individual in a non-alcoholized state.

This property of alcohol, so harmful if this vaso-motor impression and sequent arteriole dilation be excessive and too long continued, as in cases of habitual inebriety, making the once well man diseased, may come often to our aid if we use it aright, by compensating for the vaso-motor depression by substantial chemico-nurrient support, and by chaperoning it well on its way through the circulation by an ample supply of water for the protection of the tissues, without the patients having knowledge of or discretion in, the dosage or repetition of the prescription.

Conditions of blood stasis, atheromatous vascular contractures and many other states of vessel and blood demand its therapeutic employment, because of its undoubted

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physiopathologial vaso-dilation at times, its power of arteriole relaxation, as well as in certain states of toxhaemia (often autotoxic) heart depression, that suggest its opportune and helpful use to the physician. We should so employ it always, however, in such manner as will prevent secondary alcoholic disease developing, as we employ other toxic agents, the cautious employment of opium or its salts, for example.

Rightly given it may do good then as a medicine, but it is always bad as a beverage. Bad if used by the patient at his discretion and taken *ad libitum*. Only a judicious physician, conscientiously and with right information, alert and alive regarding its ultimate dangers, as a possibly pathic and fatal habit developer, should prescribe and regulate its use.

It should have place in the medical mind only as a medicine, toxic to the organism like many other medicines when given in quantities and at intervals beyond legitimate therapeutic indications.

The fear of alcohol as a beverage is the beginning, and the abstention therefrom by the oinopath, the psychopath and the doctor who prescribes for them, the conclusion of wisdom.

The vasodilator value of the alcoholics must be considered just as carefully as we regard the vasoconstrictor influence of the bromide salts over the arterioles in therapeutic problems. These properties make both exceedingly valuable in certain features of medical practice not enough considered, as we may glean from therapeutic recommendations of treatment from the present-day literature, though we must regard the danger of the drink habit in giving alcohol and the inherent neuropathic aptitude, while the drug habit of bromide prescriptions is nil, or at most, insignificant. Bromides may be cut off at any time without inconvenience to the user, while alcoholics usually can not, if the patient be well of his malady and it has been long employed.

One exceedingly valuable as well as harmful transient use of alcohol, is in its employment for overcoming sudden

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heart failure, syncope and impaired or lost consciousness. If the pulse is perceptible it is better to let the prone position restore to consciousness, with but little alcoholic stimulation nicely adjusted in dosage to the accomplishment of gradual restoration without undue vasomotor dilation, giving the shocked and damaged cerebral neurones and vasomotor centers a chance at physiological recuperation without undue cerebral congestion, especially if the cause be a blow upon the head, which may have caused an organic cerebral traumatism. But the frequent practice of young, inexperienced physicians not specially skilled in traumatic brain diseases or rightly regardful of the vasomotor paralyzing and brain-flushing power of alcoholic liquors, is to give those stimulants while the man is down, too liberally in quantity and repetition for the after good of the brain. And the first thing that suggests itself to the knowing bystander, who may have a bottle or be accustomed to daily alcoholic drinking, is to too liberally give the prostrate victim of head violence too much whiskey or other alcoholics, to the imperilment or aggravation of brain congestion or inflammation after the reaction sets in.

We may put many bad agencies and things to good use, and so may we do in prescribing the alcoholics, but they should be handled, as we may discover from even this incomplete survey of its powers, with a clear insight as to their therapeutic, toxic and ultimate brain-enthralling and disease-engendering potentialities and possibilities, even in prescription form or form of patent medicine.

Indeed, the insidious peril of the alcoholized patent or popularly used proprietary medicine is among the greatest of alcohol's dangers. They clandestinely destroy the victim before he is aware of his thraldom, if he pitifully be among that unfortunate class who, by reason of inherent neuropathic infirmity, which too often blindly seeks surcease of neurotic irritability and neurasthenia in these disguised alcoholics. Unlike one ofthe most venomous of serpents, to which a great man has compared the worm of the still and its product, they give no warning of their concealed, en-

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thralling, fatal poison to the neurone unstables and non-resisting who, once well started in alcohol-taking, can never turn back. I mean the dipsopath, the oinopath, the dipsomaniac.

In fact, the aim of all treatment, where narcotics or stimulants of any sort are employed, should be to conserve the integrity of the central neurones, especially the psychic, after the conclusion of the treatment and the recovery of the patient. This is important in the management of chronic alcoholism and acute periodic inebrlety, wherein the so-called Keely method, popularized though not originally devised by that surgeon, finally fails, because the neurological knowledge which dismisses a chronic alcoholic after six weeks more or less of brief treatment, is insufficient for the right remedy of the neuropathic antecedents and sequences of chronic alcoholic toxhemia, etc.

In conclusion, let me not be understood as discountenancing the prescription of alcoholic preparations or combinations in minimum dose for therapeutic indication in all proper cases, and always well diluted, to minimize incident alcoholic tissue damage, as in diabetes, melancholia and some fevers but in concealed prescription form.

My plea is for physiological and psychological discretion and discrimination in its use, as to dosage, method of prescription and the discountenancing of the erroneous unsanitary beverage idea for the sick, and for the prevention of the alcoholic beverage danger to the well, that may come to certain, and many persons from its needlessly prolonged and voluntary use, especially during and after convalescence.

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RECURRENT FUNCTIONAL AS DISTINGUISHED FROM THE TYPICAL ORGANIC DEMENTIA SENILIS OF THE LITERATURE.

BY C. H. HUGHES, M. D.

ST. LOUIS.

DEMENTIA of the aged has come down to us from the fathers in psychiatry as generally regarded as an organic, chronic and incurable condition of cerebral and coincident psychic decadence, and described as caused by the invariable arterial, arteriole, or brain cell, atrophic changes of senile decay or as the sequence of other organic brain disease.

Dementia senilis has been mostly described to us as it appears in most chronic forms within hospitals for the insane. The autopsic findings of pure senile dementia as described in the literature have not always been differentiated from terminal dementia in the aged, appearing as the result of previous (and acute) mental disease or a consequence of cerebral sclerosis or of tabes dorsalis or as due to the combined excesses of tobacco, alcohol or other narcostimulants and as age decadence.

But there exists beyond a doubt, for the evidence is convincing if we but closely watch and question our cases, a form of senile dementia which is merely a transient func-

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tional cerebrastheniac dementia, capable of recovery and recurrence, as functional and curable and as liable to recurrence as dementia præcox, a term misleading, inexact and unmeaning, like dementia paralytica, for the paretic is not more demented in the earlier stages of his malady than the paranoiac in the earlier periods of this remarkable cerebro-mental malady, misnamed "dementia paranoides."

Dementia præcox, with some others, might be decently interred, as the *Journal of Mental Science* has recently suggested, in a verbal cemetery. It is an adolescent insanity.*

The term "dementia," in strict psychopathic language should designate the cerebro-mental morbid state its derivation implies—dementia—the deprivation or absence of mind, paralysis of mind, not the simple morbid mental perversion with mental debility or anurgia which some authors term "dementia." But these terms have been scientifically sanctified by long accepted usage of the masters and the savants in our ranks and we shall perhaps long continue to use them.

The recognition of a condition of psychopathic neurasthenia resembling organic dementia senilis is important from therapeutic, prognostic and medico-legal points of view in which the patient and his friends, his heirs and the physicians' standing are alike interested. Because the brain of an aged, debilitated person collapses in involuntarily simulated dementia under mental stress unusual to him, we should not conclude that he is therefore to be permanently demented, even though he may have passed the three score and ten limit, or be yet older and regarded as extremely aged and old enough to die, especially by anxious waiting heirs. Cerebrasthenia comes to the aged as well as to the young and a transient or permanent impairment of memory and understanding and mental spontaneity of thought and volition may follow therefrom, simulating dementia of the aged and under judicious treatment this form of dementia may be caused to disappear. Shakespeare, in the character

*In this connection the *Journal* notes on this subject in the April, 1905, *Journal of Mental Science* and Dr. McCanahey's paper on Adolescent Insanity in the same number will prove interesting and instructive reading on this subject and incidentally on the subject of my present paper.

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of King Lear, has depicted alternating normal and abnormal senility, as he shows in Hamlet both the insanity of neurasthenia and the recuperated capacity for simulation.

In fact neurasthenic aged persons, if they be financially well circumstanced and can be placed congenially from the standpoint of a wise psycho-therapy, conducted by right psycho and neurotherapeutic skill, may recover their mental equilibrium under treatment as readily as the passion or ambition or evil habit deranged young man or woman.

More than three decades of special observation of neurasthenically demented old people, and comparing results with the general run of the organically demented of the asylums for the insane, has led to this conclusion, based on cases both within and without insane hospital practice. I have drawn my conclusions of the curability and differentiation, (from personal clinical observation in certain of my own cases) of functional and curable from organic incurable dementia in the aged, being content on this occasion to cite but one of my own, after noting the remarkable tabulated results given by T. S. Clouston, from the records of the Royal Edinburgh Asylum for the Insane.

Dementia senilis has appeared to me in the trinominal forms—first, the progressive perverted senile neurone involution symptomatically shown in prolonged and progressive psychic departure from normal mental character of the aged person and marked mental enfeeblement of speech, action and conduct of mind. "It is a progressive mental enfeeblement at the period of senile involution," dependent upon organic changes in the brain, therefore a chronic organic psychosis and we might well add that it is in its true typical form a progressive chronic organic psychosis of brain decay and unremittingly exhausted brain function. The true typical organic dement has no marked lucid intervals, so-called, of mental vigor and capacity up to the normal average of the sane old man. Once demented always demented, when the cause of the dementia is solely organic psychic neurone involution. Not so with the functional cerebrasthenic form.

The second form is likewise cerebrally organic to so

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with the functional cerebrasthenic form, but secondary and dependent upon precedent organic brain disease, as upon a previously existing mania of brain destroying origin. We then call it secondary or terminal dementia.

The third form is the one we are now discussing. It is a gradually and normally involuted brain plus an unaccustomed brain stress, a transient psychasthenia or neurasthenia involving the brain in weakness, not necessarily permanent, and causing amnesia and other symptoms of dementia not due to organic neurone irrecoverable decadence, but recoverable back to the normal state of the old person under right recuperable influences. With this differentiation between the hopeless and hopeful possibilities in dementia of the aged so long and so erroneously regarded as entirely incurable, let us now examine Clouston's record and results.

Ages.	Total Nos.	Recovered
60 to 65	62	24
65 to 70	63	21
70 to 75	40	15
75 to 80	30	9
80 to 85	3	1
85 to 90	5	2
	203	72

Clouston does not make the differentiation we here offer as an explanation of his recovered cases, but confesses that one of the most interesting and important of the results he obtained from an analysis of those 203 senile cases was a clearer idea than he had before of the course of such cases, their duration, and the results of treatment. The general result was that seventy-two of the cases, that is thirty-five per cent of them, were discharged from the hospital "recovered;" and sixty-nine cases, that is thirty-three per cent, have died; while thirty-three cases were discharged more or less improved, or not at all improved, leaving twenty-nine cases under treatment. The striking fact is the number of recoveries. He explains that the "recovery"

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from any form of senile insanity need not necessarily be, and is not as a matter of fact, an absolute restoration to pristine vigor of mind. Some such complete recoveries there were, men who went out and earned their own livelihood, women who went out and governed their households.

Esquirol, after citing Pinel's statement in his Treatise on Mania, of spontaneous cure of dementia, says that what nature effected in the case which this celebrated teacher speaks of, art accomplished for a case he records of what would, in our day, be called dementia præcox.* This author of the early nineteenth century, following Calmiel, Baile and Guislain, conceding the curability of acute dementia of adolescence and mental and acute alcoholism, admitted only the retardation of the progress of senile dementia and to some extent its termination, under country air, moderate exercise and tonic regimen, as he saw chronic senile dementia in the halls of the Maison Royal des Aliens of Charenton.

But acute dementia, his first variety, as he saw it, "resulting from temporary errors of regimen, from fever, hemorrhage, metastasis, the suppression of habitual evacuation or from the debilitating treatment of mania 'with' sudden invasion exempt from any lesion of motion" is easily cured by the combined agency of regimen and tonic treatment.† And so may the exacerbations of acute and transient seizures of dementia senilis, functional in form, as other varieties of acute dementia are curable, if the transient brain strain is removed and the general organism and the viscera are relieved and rested and restored to normal status of the abnormally oppressed and excessively anurgic burdened old person. Lighten the oppressed brain of the old man or woman of its needless burden of grief or worry, anxiety or care, and it may resume again its accustomed work, feebly as comports with the brain's age, but not abnormally and without dementia.

Andrew Combe who had a clearer conception of the true nature of insanity than any other alienist of his day

*Mental Maladies, Hunt's translation, 1845.
†Opus Citat, p. 478.

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said: "Dementia is a form of mental affection, not in itself a distinct disease, but arising from a variety of pathological states each requiring a corresponding treatment. It is characterized by general weakness of mind, involving all the faculties equally."

Dementia is a morbid condition of the brain and mind, a symptomatic expression of disease. It may be symptomatic of epilepsy or a sequel of apoplexy or fever or alcoholism or profound cerebrasthenia, especially in the aged.

"Sometimes it appears from cerebral debility more than from the continuance of actual diseases and then recovery may take place. In the asylum at Milan, cases of dementia from inanition, and which are cured by nourishing food and tonics, are not rare; but, in ordinary circumstances, its appearance indicates incurable disturbance, or actual disorganization of the brain."

Before neurasthenia was named he recognized the senile dementia that results from it, cerebral exhaustion. His dementia of inanition was a neurasthenic recurrable form of dementia caused by psychic stress and exhaustion and curable under rest, etc. This is the form of dementia in the aged of which we are writing.

Dr. Samuel E. Smith, Medical Superintendent of the Eastern Indiana Hospital for the Insane, in his last report, 1905, reflects the experience of other hospital alienists, as well as his and my own, in the following clinical prognostic observation:

"Chronic cases are not entirely without hope and promise something, and they must not be abandoned to the darkness of complete dementia.

"Every alienist knows something of the gratifying results and surprises which occasionally come from the management of so-called incurables, not excepting even the psychoses of degeneration, which are sometimes checked in their downward progress for a period of time, rarely indefinite, and it follows naturally that, as such experiences multiply, the tendency to narrow the incurable class grows."

Hugh H. was a patient admitted to the Fulton, Mis-

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souri Asylum for the Insane with a delusional form of acute mania in 1852, resulting from over brain-strain and disappointment in the mining ventures at Galena, Ill. He improved after years of restraint and rest of brain with good sleep and nutrition, as Dr. Smith the Superintendent informed me, during that and succeeding years up to 1861, and passed with age into a state which was called by my predecessors in the management of this institution, Drs. Smith and Abbot, chronic dementia. He was, however, after fourteen years' residence when I first saw him, a quiet, gentlemanly old man, having the freedom of the outside premises and of the neighboring city, going and coming each day and with regularity and punctuality, to meals and to his room and bed at night. He was not "a restless, sleepless dotard without memory, without true affectiveness." He was not slovenly and uncleanly in dress or person and showed no profound persistent general failure of all of his faculties as chronic dements do.

He was neat in dress and cleanly in person and far from that morbid unmanageable second childhood, common to his class, when grave organic degeneracy has made its destructive dementing mark on the aged brain, though he was older and feebler in brain under strained endurance, prolonged physical exercise or the long mental efforts he would sometimes indulge in, when overtaxed by converse with his sane friends. He would then collapse, at times, displaying amnesia and weak delusions and imbecility of mind till recuperated by enforced rest and a period of exclusion from friends and denial of his accustomed visits to town for awhile. When in this state of neurasthenic dementia, his early delusions of running a steamboat under the house at night (owning the premises, etc.) and of his great wealth would appear.

Under the above treatment, however, he would return to his normal state of senile mindedness without amnesia or delusions such as accorded with his age. On one of these occasions, after the asylum had been robbed of its blankets by one of the contending armies in the state, it

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was decided to send all the patients, because of lack of maintenance funds, back to their home counties. The country was on fire with excitement but the Major was tranquil and while out again with his friends was asked if the management was going to send him home. To this he responded "yes! The whole country has gone crazy and the managers wisely concluded it was useless to keep us few lunatics confined. We are coming out to join the rest of you."

There was no insanity in this opinion for a wildfire of unreasoning passion was prevailing at that time throughout Missouri and the entire land, brother was arrayed against brother and son against parent or sister, wife and husband were not in harmony, families and neighbors were arrayed in deadly feud against each other and the lately best of friends spoke not or spoke uncivilly as they passed each other by.

Senselessness of speech and conduct of dementia appeared at times during my daily knowledge of him for five years under varying brain tone states. He died of rheumatism and erysipelas in 1880 after I left the institution. His exact age was not known, though he was an old man with very white hair and stooped over when I first saw him in 1867, thirteen years before his demise.

This communication has been lately inspired by hearing the testimony of a number of medical men in an important will case, to the effect that senile dementia was always a continuously and progressively hopeless loss of the faculties of the mind, with but one inevitable ending in mental extinction, and it is to correct this unscientific error for which the literature of insane asylums is largely responsible, that this brief protest and presentation of the functional and curable phase of dementia senilis is presented. There is a true neurasthenic or cerebrasthenic dementia senilis as there is also in the aged a preponderance of organic senile decay, ending in dementia which is hopeless in its outcome. There are transient and curable states of senile dementia, in the treatment of which we should be on our guard, lest we consign the curable to hopelessness, and make no effort for their mental rescue.

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To classify all aged neurasthenic functional dements as doomed, would be like signing an unwarranted burial certificate in a case of profound shock from which the patient might rally and live.

Mary C., past the menopause, was a patient from the lower walks of life whom I had classed as an incurable dement, she having come from among the insane pauper class sent by St. Louis County. When the new St. Louis County Insane Asylum was completed and she was taken to Dr. Stevens, the first superintendent of that institution, the transfer involving an overland trip of fifteen miles in a carriage, a ferry ride of several miles, a hundred-mile railway ride and an early autumn moonlight wagon ride, she was put to work in the laundry, beginning with the simplest routine rinsing work. She continued at work in the laundry, rising from grade to grade higher in occupation there, till she graduated through the mangle and drying room as a first class hand ironer and with reason restored and dismissal. She had done laundry work before the access of her insanity, which had apparently passed on to dementia.

In conclusion let me say, this paper is written mainly with a view to correct a common misapprehension among amateur alienists especially, who without adequate clinical experience in the wide domain of psychiatry, conclude that once dementia appears in the aged it must continue to the finale of life. This, like the hopeless view of that psychic misnomer, dementia præcox, a term sanctioned even by Kræpelin, is a prognostic error for adolescent insanity which, with Brower and precedent authorities, I regard as the better and less misleading designation, because it is only a suspension and not a destruction of mental power and manifestation, which may be and is restored under changed environment, altered psychic impression and further cerebro-psychic evolution. Under right circumstances of surroundings, medical management and therapeutics, neither dementia senilis nor dementia præcox are always incurable. They may both be intermittent and recoverable cerebro-psychasthenia senilis of juveniles and should be treated accordingly and not therapeutically neglected as hopeless of recovery.

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THE

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EDITORIAL.

[All Unsigned Editorials are written by the Editor.]

THE ALIENIST AND NEUROLOGIST, entering the twenty-seventh year of its successful history, gives thanks to its many able contributors, collaborators and subscribers for valuable and cordial support in making it the now acknowledged first exponent of American psychiatry and neuriatry. Its aim has always been to be helpful to the general practitioner, as well as to the Alienist and Neurologist expert, and to the savant in morbid psychology and neurology.

It acknowledges with gratitude many personal letters of cordial appreciation, especially during the past year, and promises to endeavor to continue to merit during the present year the good opinion of the profession interested in its peculiarly useful work.

AN ILLUSTRATION OF PSYCHOKINESIA occurred about the close of the past year in one of our city courts, displayed in the firing of a revolver in the direction of the

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judge by one of two sister contestants in a will case, in which they claimed injustice in the judge's ruling apportioning a part of the property to a prenuptial but legitimatized heir of the deceased, and the perpetrator and abettor of the uncontrollable, if not premeditated act, was admitted to bail. Our courts ought to learn something of the medico-legal aspect of these psychokinesias and imperative homicidal conceptions, where explosive psychocerebral action dependent upon defective cerebropsychic inhibition are liable to be repeated, like thunderbolts are to come from sometimes fair skies, and rule accordingly. Sequestration for homicidal, suicidal, pyromaniacal and other psychokinesias is the proper treatment, where these impulses are not rational, voluntary and purely criminal. It may be that these girls were overwrought by the strain of the trial, the reflection that an illegitimate was getting a share of their legitimate legacy, and perhaps a non self-restraint training from their childhood, which is now-a-days the cause of much psychokinesia, which should not be extenuated as abnormal and exempting from penal legal consequences. Little-enlightened, self-styled experts in alienism now-a-days often mistake the culmination in crime of lives of unrestraint for the disease form of psychokinesia. The latter being insanity, the former being the wanton wilfullness of pure cussedness, not deserving of the mercy demanded by morbidly engendered psychokinesia. Great criminals, committing the most heinous and revolting crimes, sometimes escape merited legal punishment through pseudo-insanity experts, unable to rightly diagnosticate insanity from gross criminality, because of ill-acquaintance with the clear data of true psychiatry, being unable to discern or exclude the disease element whose presence or absence alone should convict or set free for a home in an insane asylum.

A pyrophile or a kleptophile, who would attempt to set fire to the court house or steal an attorney's pocket-book, would be charged with incendiarism or petit larceny, and have the question of pyromania or kleptomania or plain incendiarism or theft settled while the perpetrator was kept in custody.

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PLACEBO PHILOSOPHERS AND THE BISMARCK ARCHIPELIGO EXPERIMENT appear to have proven a failure, one of the enthusiasts having died from inadequate raiment and food, exhaustion and exposure, another having been murdered by the savages. This colony was to have been a primitive, simple life paradise, inhabited by a coterie of German authors who were to live "close to nature" like primeval man. They were to be a body of *sol fraters* or sun brothers, who, living and bathing continually in the sunlight, without clothing, on the fruits of the forest and the product of the sweat of their faces, tilled soil and tended herds. It is recorded from Berlin that Herren, Lutzow, Engelhardt and Battman perished of the causes above named, causing the other victims of this delusive Utopian dream to return in despair to civilization, convinced, no doubt, as the deluded enthusiasts of Topolabampo were, that it is "better to endure the ills we have than to fly to others we know not of," probably convinced also that a long life through many generations of routine civilized habit, with its luxuries and *laissez faire*, cannot be exchanged for the food, clothing and indulgence limitation of a non-policed forest life in a non-tropical country. And so the Island of Kabakon must get along yet awhile longer without Utopian philosophers among its population and Deutschland must endure them yet awhile longer at home.

The primitive Arcadians, who apotheosized Pelasgus for having taught them the superior nutrient properties of acorns or herbs, their former diet, were not so cultivated as this coterie of misguided German savants, but they were no bigger fools, though they began their exclusive vegetarian foolishness five or more centurics earlier, even a century or two before Oenotras and several centuries after the singular segregation of Evander.

The breakfast chips and nut foods of the vegetarians of our day originated along way back in gastronomic history. The food cranks are not the sanitary innovators some of them think they are.

They are even antedated by the alchemists and the

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fountain of perpetual youth prospectors. The human mind often verges on insanity in its search after Arcadias, Eldorados, Sanitorias and placebos for the mind ill at ease. The discontent of that tired, depressed and dissatisfied feeling of cerebrasthenia prompts and promotes the seeking of many changes of environment. The hope of relief from the monotony and weariness of life probably prompted the bizarre seclusion experiment of these philosophers of Berlin. Before departing they should have consulted an alienist and neurologist like Mendel and his confreres in psychiatry and neuriatry there.

PHYSIOLOGY AND THE PHYSICIAN.—Dr. Wesley Mills, author of Animal Physiology and professor of physiology, McGill University, in a recent forceful essay read before the June, 1906, meeting of the A. M. A., on the subject, "a physician's creed, past and present, as to the physiology of the heart," a subject upon which, from study of his work and personal familiarity with his methods, we regard him as expert, expresses the opinion "that physiologists and physicians have stood too much apart. Although the American Physiological Society has held meetings for a great many years in the different great centers of the country, but few physicians ever attend those meetings or even read the reports of the papers presented, probably because they are usually published in periodicals other than medical.

In most instances teachers of physiology today are not men in active medical practice, while many never were doctors, except academically. This has its advantages, but also some disadvantages. Physiology as such, even yet, it is to be feared, is only occasionally brought before the student in the wards of the hospital or elsewhere when once he has passed the examinations on the primary subject; while the medical investigator has been so occupied with morbid anatomy and bacteriology that a physiologic medicine in the sense of one pervaded through and through with the conception that disease is altered function and the whole of medicine a study of this changed function, can not

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be said to be the dominant state of mind even yet, though one sees hopeful signs that progress is being made toward it."

Referring to practicing physicians and surgeons, he says further: "For the latter, still more than the former, is apt to indulge in the belief that physiology is somewhat superfluous for his purpose, though I may point out that the surgeon who in our time has contributed most to the advancement of his art, Sir Joseph Lister, was himself a practical investigating physiologist, a fact which has made itself felt throughout his whole career." To all of which, the *Alienist and Neurologist* subscribes its full concurrence.

At an earlier day, when taking official part by invitation in the conduct of the section on physiology of the Philadelphia Centennial Congress, the propriety of our so doing was questioned by some because we were not then an exclusive laboratory worker.

The editor's address in medicine, in its neurophysiological aspects, at the California meeting A. M. A., was unfavorably criticised by some medical friends, of whom the author expected better things. Some of them know better now. They have made some neurophysiological advances since then in the interpretation of the neural relations and therapeutics of disease.

But times have changed and men have changed and are yet changing with them.

The consideration of morbid processes and pathological results and the relation of physiology to them, especially in relation to the neurophysiology is more general in the profession now than then, though Cullen, whose dictum we adopted as our shibboleth at the founding of this journal in 1880, took a markedly neurological view of the processes of disease, a view to which the medical profession must come again with the beaming sun soon to break into a flood of neurological light on the "movements of the organism in disease," as Cullen saw them.

We hope later to find time and space to further dis-

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cuss this interesting contribution to current medical literature. In the meantime we commend it to readers of the *Alienist and Neurologist*. We take a personal pleasure in expressing our long indebtedness to our friend for the helping hand we have psychically held so long through his physiological researches.

Dr. R. O. Beard, of Minneapolis, who also considers the subject (including microscopy) in its relation to the practice of medicine (*St. Paul Med. Iour.*, Jan.,) says "that in the service of surgery and internal medicine alike, this branch of physiologic science is destined to fill an important role. It offers to the general practitioner an element of added interest and accuracy in clinical observation. To the expert it offers an opportunity which will become greater, etc."

And Krehl, discussing myocardial and neurogenic cardiac disturbances, urges more thorough study of these cases from a psychological and psychiatrical standpoint.—*Muenchen-Medizinische Wochenschrift.*

And so medicine moves forward on neurophysiological, as on other lines of observation, discovery and conclusion, for the betterment of mankind.

A PSYCHIC BLOCK SYSTEM FOR RAILROADS.—The accident bulletin issued from Washington by the Interstate Commerce Commission for the three months ending March 31, 1906, shows the total number of casualties to passengers and employes to be 18,296—1,126 killed and 17,170 injured.

The number of passengers and employes killed in train accidents was 274.

The total number of collisions and derailments was 3,490 (1,921 collisions and 1,569 derailments) of which 289 collisions and 167 derailments affected passenger trains.

The most disastrous accident reported, a collision causing thirty-four deaths and injuring twenty-four, was due to a striking failure of the train dispatching system, according to the commission. A telegraph operator at a small station, who had been on duty all day and more than half the

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night, fell asleep, and on awakening, misinformed the train dispatcher as to what had occurred while he slept. The commission concludes after the statement "that the block system repeatedly advocated by the Commission is the true means that ought to be adopted for the prevention of such disasters, especially such as that caused by the over-time-exhausted and sleeping telegraph operator."

There is another and quite as important a block system for the prevention of accidents, and that is a rigidly enforced psychic block system that will block brain-tired and brain-weakened incompetency for all railway positions, when and where inaccuracy of brain work may menace life or mean death.

A block system that blocks overtime work and off duty dissipation or other neglect of rest and sleep, is the need of the hour in railway and other responsible service.

Neurasthenic, sleep-needing brains are out of place where insomnia is a duty and not a disease.

Railway companies that secure adequate sleep to employees will increase net earnings and diminish the injuries they inflict upon people who must travel on their now too heartlessly managed railroads.

LOMBROSO AND THAW.—Caesare Lombroso has made a long range, premature and mistaken diagnosis of the mental state of Harry Kendall Thaw, the murderer of Stanford White, from an anthropological standpoint. Lombroso pronounces Thaw an epileptic moral maniac, a conclusion from the slight symptoms and mostly slight signs detailed by Lombroso, in which the clinically skilled alienist cannot concur on the evidence (?) given by Lombroso. Thaw's sisters, brothers and his mother, now attending the trial, show the facial and aural resemblances in features characterized as evidences of degeneracy and raising the presumption of epilepsy and moral mania by Lombroso, yet they have never displayed the "jealous homicidal obsession" which M. L. says was displayed by Thaw. To become a slave to one's passions may proceed

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from persistent indisposition to exercise proper inhibition and not necessarily from overmastering degeneracy. Dalliance with sin by one pecuniarily above the necessity of daily counteracting labor is not *prima facie* degeneracy.

But we shall have to defer criticism of this remarkable *faux pas* of the well-known criminologist for a more extended and critical analysis, to be presented in our next issue.

Thaw's madness can not be traced to an "unconquerable instinct, or epileptiform" state due to the fact that "his father, in a few years, made himself from nothing to a millionaire." Such reasoning is supremely specious and fallacious, and unworthy of the true science of criminology or alienism.

Deviations of form and feature through accidents or defects of evolution and development, and likewise psychic eccentricities are not necessarily evidences of moral degeneracy, and anthropological inference of mental or moral perversion from them, are not always sound psychiatry.

Even as we write, this "homicidally obsessed, degenerate, moral maniac," is aiding his counsel in selecting the witnesses who are to judge him and his fatal act.

Lombroso makes the same mistake here that he has made on another occasion concerning the degeneracy of Columbus.

A RIGHTEOUS JUDGMENT!—A righteous St. Louis City Judge lately decided that hot water in the external ear is a violent external injury. Suits like this reveal the unfeeling resistance to the just demands of those who place their trust and money in insurance companies and the trick juggling with the term "accidental violent external injury." Hot water in the external ear is certainly an external injury, but it is also internal and all external injuries that cause death must also act internally and become internal injuries. It's a wonder the insurance company in its subterfuge resort, did not contest on the ground also that it was not the external injury, but the internal that killed.

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But there is a hidden, sinister purpose and rank injustice in this insurance phrase "violent external injury" and that is to bar out the many really violent concussional and cerebro-psychic shocks of accident to the neuraxis that undo one for life or a long period life, changing the mental nature and neurophysical ability for accustomed avocations, resulting from accidents on railway trains, automobiles, explosions, electric shocks and other collisions and other catastrophes that ruin the nervous systems and yet make no sign visible to the mind of the average railway surgeon and insurance medical examiner, or if mentally discernable by such medical men of wide knowledge of the nervou ssystem, they are not expected by their employing directing masters to see it, only through "violent external injury." It is a reproach to railway and insurance medical advisers and an evidence of unscientific knowledge of the susceptibility of the nervous system, that companies employing them have been erroneously advised that grave injury to the brain or spinal cord and peripheral nervous system, including the sympathetic, that injury to these nervous systems so vital to the life, liberty and happiness of individuals, can not occur without "violent external injury."

Mentally lame medical monitors make vicious insurance company rulings. It is fortunate for insured humanity that we yet have courts to rectify such miserable medical mistakes of conclusion.

A better knowledge of the nervous system and the causes of its diseases would save the medical profession humiliation and the insurance companies such just judicial rebuke.

APPEAL BY EDWARD S. MORSE, in *Boston Herald*, to stop steam whistles, and advising us of the painful fact that "within a few years there has come to us on steam railways a series of whistle signals which, in some towns, at least, have rendered life for many unendurable."

In the appeal our attention is called to ordinance of city of Cleveland, Ohio, section 841. "*Engine whistles*. No whistles connected with any railway engine shall be sounded

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or used within the limits of the city of Cleveland, except as a signal to apply the brakes in case of immediate or impending danger.

"Section 843. *Stationary engines.* No person shall blow or cause to be blown within the limits of the city of Cleveland the steam whistle of any stationary engine as a signal for commencing or suspending work or for any other purpose except as specified in the next following section.

"Section 844. Nothing in this subdivision contained shall be construed as forbidding the use of steam whistles as alarm signals in case of fire or collision or other imminent danger, nor for the necessary signals by the steam engines of the fire department of the city."

Detroit, Michigan and Newcastle, Penn., have passed similar ordinances, with penalties of fines and imprisonment for infringement.

Mr. Morse would be pleased to know of any other town or city in which similar laws have been enacted. We hope St. Louis will soon be in the list of anti-needless noise cities. Great noises shock the nerves and injure the health of people, and should be abolished whenever practicable.

Dr. C. C. Wiley of Pittsburg, Thaw's family physician, testifying as an expert on insanity, which few family physicians are capable of doing, is reported to have become badly confused under the merciless cross-examination of District Attorney Jerome and admitted that he was not familiar with the Romberg test for insanity, though he apparently, at first made the impression that he knew what it was.

Now the Romberg test or the Brach-Romberg sign, as it is also called, is not a symptom of insanity, but one of locomotor ataxia or spinal sclerosis especially. Only the ataxic insane could have it and they are rare. An alienist might be expert in insanity and not know the significance in spinal sclerosis to which it especially belongs.

He is also reported as "falling down" on the neural

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relations of the cardiac nerve, a branch of the pneumogastric, with cervical sympathetic relation.

There are so many hundreds of nerves and more branches that any man might miss in such anatomical memory and yet understand the brain in relation to insanity. Both of these were irrelevant catch neurological and not psychiatrical questions, just as the Argyll-Robertson pupil question was. None of them were germane nor fair and would have been ruled out by the court, if court and attorneys knew how irrelevant they were to any question in psychiatry.

Dr. Wiley certainly made a grave mistake in saying a dilated artery was not diseased. The walls of an artery may dilate through direct disease, as in aneurism or hyperæmia from direct cardiac over-pressure or vasomotor paresis, etc. The district attorney did not however help his cause by confusing this witness. The facts observed will be noted by the jury.

PSYCHIC SANITARY SENSE COMING TO THE SENATE..—Daily Time Limit to Railway Service.—By a vote of 70 to 1, the Senate January 10th passed a bill providing that railway employes engaged in handling trains shall not work more than sixteen consecutive hours, which period is to be followed by ten hours off duty. The one negative vote was cast by Senator Pettus.

The act, unfortunately, only applies to "trains doing an interstate or foreign commerce business." Amendments provide for extraordinary exigencies, as for accidents and delays and obstructions in consequence thereof.

Such a law should be among the statutes of every state, in the interests of health and life of employes and the public. Railway management efforts to annihilate time of brain rest and make the brain a perpetual motion machine should cease. Smart railway management should seek economy and the making of dividends in other ways than by overstraining, unresting, and prematurely wearing out and weakening, for train wreck results, the brains of railway employes.

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The people as well as the railway service have rights to healthy, clear acting, vigorous railway service brains, that can always do the right thing, at the right time, for the traveling public's safety. Some American railways' managers appear respecting the demand upon employes as if they were themselves brain-weakened by water on the brain.

THE PROFESSIONAL ENDEAVOR in the direction of abstention from the far too liberal alcohol prescribing of the past, coupled with popular awakening to the brain, body and mind damage of alcoholic daily drink, gives hope of escape from what has been and still is a menace to manhood and national decadence, among the causes that threaten the undermining of civilized mankind.

Wise political communities seeing alcohol's destructive power in the portrayals of pathological science, revealing alcohol's organic ravages of brain, other viscera and the blood vessels and the blood's disordered quality and movements, are taking, or have taken, defensive action. Science only reiterates the teaching that wine, as a health promoter is a mocker, and "whosoever is deceived thereby is not wise." Who hath redness of eyes and blossoming nose and florid face from daily drink hath also redness and more or less congestion of brain and stomach and other organs, because of morbid vasomotor dilation and the "wounds without cause" external, of the inebriate, are wounds from morbid states of brain.

An agency that causes paresis and instability of psychic and psycho-motor neurones and their later more destructive consequences is not an agent for the safe and sane of thought to habitually use, nor is it fit for indiscriminate prescription by physician, priest, trained nurse or patient.

ETIOLOGY OF SPEED MANIA.—*The St. Louis Republic*, noted for its forceful editorial utterances, makes the following comment on a recent communication by Dr. Lee Howard, quoted in the *British Medical Journal*, referring to the motor speed mania:

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Doctor Lee Howard, is quoted in the *British Medical Journal* to the effect that the delight in fast automobiling and the craving for strong drink are etiologically the same thing.

A feature of the present age, he believes, is the increasing tendency toward explosions of psychic energy, one objective symptom of which is the mania for high speed, and others the drug mania and the alcohol mania. It is observable that explosions of psychic energy correspond with those of gasoline, which fact suggests the advisability of carrying some sort of a spark-plug in the hat of those dangerous beings whose psychic excess energy predisposes them toward reckless driving.

But, it is doubtful in point of fact—which seems to contradict the eminent physician's theory—whether a crazy chauffeur has an excess of real psychic energy. His cerebral coils probably generate very little. But it is conceivable that buck beer or rye highballs might stimulate his convolutions and excite a craving for speed, while fast driving is known to have a pronounced effect on thirst.

Thus, we suggest for the distinguished doctor's consideration, a vicious circle might be created. Etiologically the relation of booze, benzine and the bughouse is plain enough if we adopt the more practical and less scientific viewpoint.

ADEQUATE TIMELY SLEEP FOR THE NORMAL MIND, as well as the abnormal, is a recognized essential of psychic sanitation in the estimation of alienists, neurologists and physicians in general, though it does not yet appear to have received the consideration it deserves from those who demand and dispose of the mental work of others, especially in the railway service, in witness whereof we cite the following, to be added to many other and more disastrous brain strain requirements of our American railway management, but none more cruel and criminal on the line of unremitting brain work demanded.

Last November, seven men, the crew of a Lehigh & Hudson freight engine, who had been in continuous service three

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days and three nights, went to sleep on the locomotive while it was on its way from Franklin Junction to Phillipsburg. All hands were asleep when the engine went through the yard at this place, passing the red light turned against them.

The telegraph operator here wired a message to the operator at Martin's Creek, the next station down the line, to be on the lookout for the engine. Its speed was considerably reduced when it reached that station, and the operator succeeded in boarding it, and preventing a collision by running the locomotive to a siding.

The fire was hastily pulled from under the boiler to prevent an explosion, the water having reached a very low point.

OUR PROPRIETARY PHARMACEUTICAL ALLIES.—It is conceded the world over that the best sort of proprietary therapeutic firms have given to the medical profession many elegant and agreeable formulae of valuable but otherwise unpalatable medicines. Among these can be mentioned pleasant combinations of cod liver oil and the pepsins and the enzyme class. Certain pharmacists have advanced the profession a century in knowledge and use of certain drugs, such as the Parke-Davis specialties.

Others have given us American products where we had before relied on foreign markets, such as the Powers & Weightman quinine, the Fairchild Brothers & Foster's enzymes, Squibb's chemicals, etc.

Combinations of definite and certain strength, like Battle's bromidia and Peacock's bromides, have especially helped the young country doctor not perfected in pharmacy and looking about for plain, palatable, ready prepared formulae of certain ingredients easily dispensable.

The danger in the use of these agencies is not in the drug, but in their unwise prescribing——in ordering them by the bottle, to be taken at the discretion of the patient. But the same danger exists in ordering any drug of the hypnotic class, or in fact of almost any kind, and leaving its renewal and continuance to the dis-

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cretion of the patient. Medicine prescribed for repetition at the discretion of patient or druggist almost always proves a source of greater harm than final benefit.

IN LINE WITH THE ADDRESS OF VICTOR HORSELY, before the Canadian meeting of the B. M. A., is the appeal for more milk and less beer for the babes and mothers of England and Wales, in the face of the infant mortality of last year, viz: one hundred and twenty thousand babies dying there last year, making even the fittest unfit to live, as Sir Henry Campbell Bannerman said. Pure milk depots for babies and mothers in lieu of beer are the remedies, and the medical advice for nursing mothers of beer in lieu of better nutrition is an exploded fallacy. The milk depots have already done much good, as Minister John Burns lately attested.

He found that the deaths in the sterilized milk fed area ranged from 50 to 100, while in other areas the death-rate was from 100 to 273. In the face of figures like that it seemed to him that the milk depots experiment, incomplete though it had been, was an experiment that warranted careful development and rapid extension. The bill on the subject is now in draft.

He said that one of the chief contributing factors towards the high mortality was the tendency on the part of people to spend on beer what they should spend on food for their infants, and on leisure and rest for the mother.

It is gratifying to medical science to see more correct common sense and enlightenment taking hold of and swaying the people in regard to the too long entertained delusion that alcohol is a sort of support and food substitute in its many seductive beverage forms, as if any blood and brain cell poison could be good for habitual daily use.

"LEGISLATIVE SCHEMES OF THE AMERICAN MEDICAL ASSOCIATION."—In nearly if not all the State Legislatures now in session, bills have been introduccd which seek to compel manufacturers of proprietary and patent medicines

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to make public the formulas and private processes by which their preparations are made. A bill of similar import, dealing with interstate traffic in medicines of this class, has also been proposed in the House of Representatives at Washington.

The large number of these bills, their apparent spontaneity, and the noisy clamor of their advocates, would make it appear that the American people had suddenly awakened to the realization that they have long been victims of some monstrous wrong.—*Abstracted from "Legislative Schemes," sent out by the American Journalist.*

And this is the monstrous truth so far as concerns a certain number of the many new name-blind combinations offered to the medical profession for prescription on faith rather than that definite knowledge of composition necessary for intelligent prescription and the gleaning of accurate therapeutic knowledge.

"SIGHT-UNSEEN" LAWYER AND DOCTOR CHOOSING.—Secretary Shaw tells this story on Congressman Smith, of Iowa, according to the *St. Paul Pioneer Post*. A prisoner arraigned before the criminal court. Present in court room: Lawyers Smith, Brown and Greer.

"Where is your lawyer?" inquired the Judge.

"I have none," responded prisoner. Haven't any money.

"Do you want a lawyer?" asked the Judge.

"Yes, Your Honor."

"There is Mr. Smith, Mr. Brown and Mr. Greer," said the Judge, pointing to the young attorneys awaiting briefless and breathless for something to turn up, "and Mr. Alexander is out in the corridor."

The prisoner eyed the budding attorneys in the court-room, and after a critical survey stroked his chin and said, "Well, I guess I will take Mr. Alexander."

And this is the way many people also select their physician. They wait until some emergency demands immediate medical aid, and then they have some one suggested on the spot and of whom they know only that he belongs to the profession.

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AN ALCOHOLIC DRUNK THEFT OBSESSION.—A young minor, Geoffrey Ryan by name, of St. Louis, without previous criminal record of the kind, after several drinks of whisky unlawfully sold to him, stole a buggy in the West End and proceeded to hold up (with a pistol that would not go off) and rob, under influence of a daring, alcoholically-excited frenzy, one pedestrian after another, till he had robbed on the streets more than half a dozen in the short space of a few hours in the evening, when he was taken into custody by the police.

His predatory performance was not characterized by much more discretion than a procursive epileptic might display, save that being in a buggy and stopping to halt and hold up his victims, served unwillingly to disarm pedestrians of suspicion of the robber.

Excise Commissioner Mulvihill is acting the part of the good psychiatrist and Samaritan by seeking to find and annul the licenses of the saloons who unlawfully furnished the boy drink.

ALL NIGHT AND EIGHT HOUR LABOR SHIFTS FOR THE CANAL ZONE.—We are approaching the time when there will be, as there should be now, with the aid capital and invention have given to labor, three daily shifts for the world's work. It should be inaugurated for humanity's sake and the best of sanitary reasons at the Panama Canal. The work there for all is arduous, the atmosphere is not salubrious, to say nothing of the anophile mosquito that breeds the deadly Chagres haematuric malarial fever and the stegomia faciata that causes yellow fever, now happily nearing extinction there through the sanitary work of the U. S. government through Colonel Gorgas and his medical co-workers. The facility with which electric light can now be made and placed, would make possible the working of night shifts on the Canal route, and light all night would be salutary to health throughout the entire canal zone.

CONDITION OF CUBAN INSANE ASYLUM.—One thousand six hundred patients crowded into quarters with capacity for but four hundred. Last October Governor

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Magoon visited the National Insane Asylum at Havana and discovered a deplorable state of affairs there.

"One thousand six hundred and sixty persons of both sexes were crowded into filthy and dilapidated buildings, with a capacity for four hundred persons only. They are sleeping on broken cots, relics of the last American occupation.

"Congress made an appropriation to enlarge the asylum, but the money was never expended."

We note with pleasure that Governor Magoon will take steps to erect a decent building and remedy the defects in provision.

HYSTERICAL MONOPALSIES.—It is well to continue the record of these cases as they are sure to keep alive the fact of mind cure, possibilities and the explanation of the marvellous (!) results of mind and faith cure christopathic, osteopathic, and other methods of psychic impression. Three cases of this kind were reported by Dr. C. C. Hersman in *Jour. A. M. A.* last year, one resulting from fright and the other two from traumatic shock. The arm, leg and diaphragm were the seat of the local manifestations. The spasms would last for several hours. These cases prompted Dr. H. to ask if there is an irritating or paralysing center within the cortical psychomotor centers. Are these nerve center neurones at this time bathed in irritating cerebro-spinal fluid? In other words does some decrease in metabolic elimination cause transient increase of cytotoxins? This question has been asked before in regard to epilepsy and affirmatively answered in the minds of some neurologists.

THE ACHING TOOTH AND THE MOTORMAN.—An Eastern street car motorman stopped and left his car to get his tooth pulled. On his return, minus the tooth, the patient, sympathetic passengers cheered and the car moved joyously on, the crowded sitters and swaying strap-hangers forgetting their own misery in the happiness of the man whose distraction was relieved by the extraction. And the

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company continues to "pull the public's leg," as usual, with the customary, inadequate accommodation.

The pull of a traction company with the "powers" of most American cities is stronger than a dentist's tug at a tooth that won't come out, except when they tackle the dens sapientiæ. Dens sapientiæ is easy in the dentist's hands, like the public in the hands of the traction management.

AN ANDROID WOMAN HOMOSEXUALLY CONJUGALLY MATED to a woman, or a gynesiac man, has been lately puzzling the daily press, especially in Chicago, in the person of Nicolai de Raylan, husband of Mrs. Anna Davison de Raylan. Nicolai de Raylan is described as beardless and otherwise effeminate in appearance, and with the usual reportorial embellishment, he is described as shaving four times a day, ineffectually endeavoring to develop a beard.

He was for thirteen years secretary to Baron Schlippenback, Russian Consul. He is reported to have died at Phoenix, Arizona, where through a coroner's autopsy his true sex was discovered.

THE NAME OF THE JOURNAL OF *The Association of Military Surgeons* of the U. S. has been changed with the issue for January, 1907, to "*The Military Surgeon*," and we take pleasure in noting the fact, as the abbreviated name sounds better and means as much. This good journal has been highly successful in its brief career of six years as the pioneer military medical journal in the English language, under the able and judicious editorial direction of its secretary and editor, Maj. James Evelyn Pilcher, Brigade Surgeon, U. S. V., Captain (Retired) U. S. A. and its distinguished managing corps of military medical men.

LORD ROSEBERY'S BRILLIANT IDEA OF THE CAUSE OF THE INCREASE OF INSANITY.—*The London Spectator* reports the distinguished Englishman as saying at the dedication of a hospital for the insane, he found it extremely difficult to discover any convincing reason for the increase

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