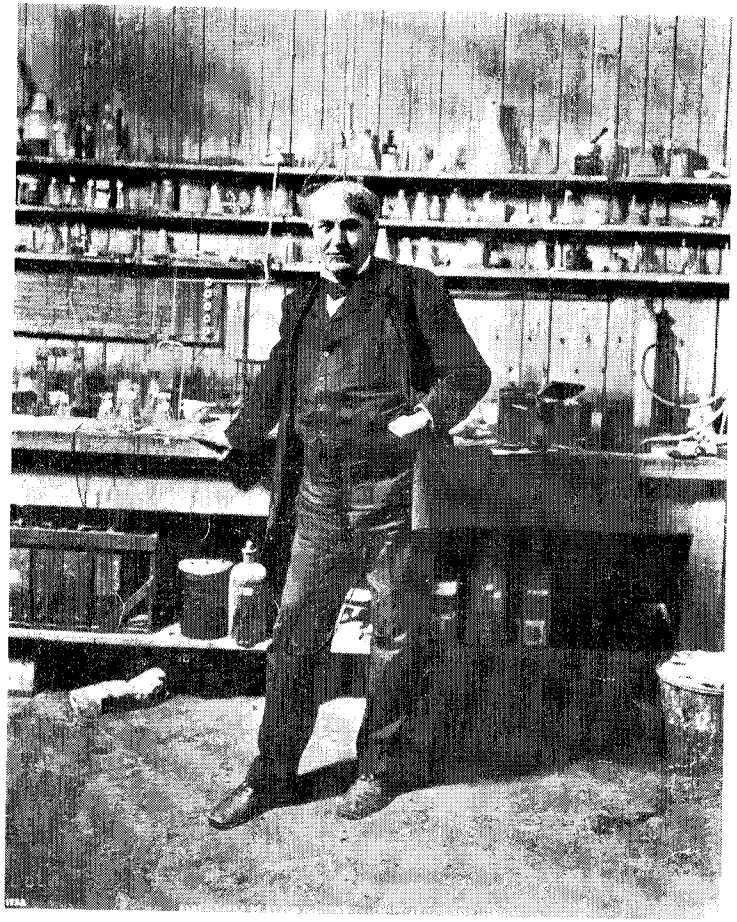

EDISON IN HIS CHEMICAL LABORATORY

The Diary

AND

SUNDRY OBSERVATIONS

OF

THOMAS ALVA EDISON

EDITED BY
DAGOBERT D. RUNES

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NEW YORK

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vast armament which, after all, must be principally notable through the fact that it becomes so quickly obsolete.

These things are important, but even more important is such economic knowledge as will enable us to readjust and actually get back to normal after any period of abnormality.

We cannot get on our feet until we have a market for our goods, and, curiously enough, the world cannot get on its feet until we stand firmly upon ours.

We cannot have a market for our goods till the European monics have been stabilized.

To restore exchange to normal would be a great thing for us. It would help us as much as it would help the British.

It sometimes is bad business to keep bankrupts in their bankruptcy. Every day wise creditors in ordinary business lend new sums to their bankrupt debtors in order that they may start again. Business recognizes this as a good policy as long as the debtor's character, experience and record are good.

We should reason thus when we think of England and France. It is infinitely important to us that they should be back upon their feet.

I-1-1922

VIII

The Realms Beyond

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THE REALMS BEYOND

XXXVIII · LIFE AFTER DEATH

THE THING which first struck me was the absurdity of expecting "spirits" to waste their time operating such cumbrous, unscientific media as tables, chairs, and the ouija board with its letters. My convinced belief is merely that if ever the question of life after death, or pyschic phenomena generally, is to be solved, it will have to be put on a scientific basis, as chemistry is put, and withdrawn from the hands of the charlatan and the "medium."

My business has been, and is, to give the scientific investigator—or, for that matter, the unscientific—an apparatus which, like the compass of the seaman, will put their investigations upon a scientific basis. This apparatus may perhaps most readily be described as a sort of valve. In exactly the same way as a megaphone increases many times the volume and carrying power of the human voice, so with my "valve", whatever original force is used upon it is increased enormously for purposes of registration of the phenomena behind it. It is exactly on the lines of the tiny valve which in a modern power-house can be

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operated by the finger of a man and so release a hundred thousand horse-power.

Now, I don't make any claims whatever to prove that the human personality survives what we call "death." All I claim is that any effort caught by my apparatus will be magnified many times, and it does not matter how slight is the effort, it will be sufficient to record whatever there is to be recorded.

Frankly, I do not accept the present theories about life and death. I believe, rightly or wrongly, that life is undestructible, it is true, and I also believe that there has always been a fixed quantity of life on this planet, and that this quantity can neither be increased nor decreased. But that does not mean that I believe the survival of personality has been proved—as yet. Perhaps it may be one day. Perhaps some apparatus upon the lines of my "valve" may prove it, but that day is not yet, nor have I as yet secured any results to definitely prove such survival.

What I believe is that our bodies are made up of myriads of units of life. Our body is not itself *the* unit of life or *a* unit of life. It is the tiny entities which may be the cells that are the units of life.

Everything that pertains to life is still living, and cannot be destroyed. Everything that pertains to life is still subject to the laws of animal life. We have myriads of cells, and it is the inhabitants in these cells, inhabitants which themselves are beyond the limits of the microscope, which vitalize and "run" our body.

To put it in another way, I believe that these life-units of which I have spoken band themselves together in countless millions and billions in order to make a man. We have too facilely assumed that each one of us is himself a unit, just as we have assumed that the horse or dog is each a unit of life. This, I am convinced, is wrong thinking. The fact is that these "life-units" are too tiny to be seen even by the most high-powered microscope, and so we have assumed that the unit is the man which we can see, and have ignored the existence of the real life-units, which are those we cannot see.

There is nothing to prevent these entities from carrying on the varied work of the human body. I have had the calculations made, and the theory of the electron is, in my view, satisfactory, and makes it quite possible to have a highly organized and developed entity like the human body made up of myriads of electrons, themselves invisible.

Further, I believe that these life-units themselves possess memory. If a man burns his hand, the skin will grow in exactly the same pattern again, and with the same lines as the hand originally had before the accident. Now, it would be quite impossible for those hundreds of fine lines to be meticulously reproduced if there were no memory for detail behind the rebuilding of them. The skin does not grow that way and in exactly the same pattern again "by chance." There is no chance.

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But are all these life-units, or entities, possessed of the same memory, or are some, so to speak, the builders' labourers, and are others the units which direct those labourers?

It may be that the great mass of them are workers and a tiny minority directors of the work. That is not a matter about which we can speak with any certainty.

But what one can say with some assurance is that these entities cannot be destroyed, and that there is a fixed number of them. They may assemble and reassemble in a thousand different forms from a starfish to a man, but they are the same entities.

No man today can set the line as to where "life" begins and ends. Even in the formation of crystals we see a definite ordered plan at work. Certain solutions will always form a particular kind of crystal, without variation. It is not impossible that these life-entities are at work in the mineral and plant, as in what we call the "animal" world.

In connection with the problem of life after death, the thing that matters is what happens to what one may call the "master" entities—those that direct the others. Eighty-two remarkable operations on the brain have definitely proved that the seat of our personality lies in that part of the brain known as the fold of Broca. It is not unreasonable to suppose that these entities which direct reside within this fold. The supreme problem is what becomes of these master entities after what we call death, when they leave the body.

The point is whether these directing entities remain together after the death of the body in which they have been residing, or whether they go about the universe after breaking up. If they break up and no longer remain as an ensemble, then it looks to me that our personality does not survive death; that is, we do not survive death as individuals.

If they do break up and do not remain together after the death of the body, then that would mean that the eternal life which so many of us earnestly desire would not be the eternal life and persistence of the individual, as individual, but would be an impersonal eternal life—for, whatever happens to the life-units, or whatever forms they may assume, it is at least assured that they themselves live forever.

I do hope myself that personality survives and that we persist. If we do persist upon the other side of the grave, then my apparatus, with its extraordinary delicacy, should one day give us the proof of that persistence, and so of our own eternal life.

VIII-1922

XXXIX · LIFE'S FLASHBACKS

WE DO NOT REMEMBER. A certain group of our little people do this for us. They live in that part of the brain which has become known as the "fold of Broca."

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Broca discovered and proved that everything we call memory goes on in a little strip not much more than a quarter of an inch long. That is where the little people live who keep our records for us.

Some of the little peoples who enable us to remember things do nothing else during our entire lives but watch moving picture shows. Everything that comes in through the eyes comes in the form of moving pictures. These pictures come so rapidly that, like the pictures on a screen, they seem to be but one picture, but in fact they are millions. The optic nerves bring the pictures through the small holes in the front of our skulls into our brains where the little peoples whose function it is to remember can see them. We do not remember everything we see because everything is not worth remembering. Little Peoples, like "big peoples," are of various degrees of intelligence. Some will choose to remember what others will choose to forget. But whatever their intelligence, they all seem to be impressed by the startling and the unusual. The thing is remembered that makes an impression. When a human being is young and his little memory-people have empty record cases, many things make an impression. That is why so many childhood memories linger throughout our lives.

A man was here the other day who had recently visited the school-house he attended when he was five years old. He told me that as he approached the place everything seemed much as he had left it almost half

a century before: the hill down which he used to coast had somewhat flattened out; it was not the little Matterhorn, the memory of which he had carried with him so many years, but a very gentle slope. As he drew nearer the little building his mind was flooded with memories; this thing, that thing, and the other thing—there they were just as he had left them. But when he approached one of the side windows and looked into the room where he learned the alphabet, he got a great shock. Something was wrong with the windows! They were too low. As he looked through the little panes of glass he became distinctly uncomfortable. What was the matter? Then the answer came to him. The last time he had looked through that window he was so short that he had to grab hold of the sill to pull himself up. He had grown so tall that his eyes were perhaps three feet above the sill.

Now see what had happened. For more than forty years some of the little people in this man's brain had carried about with them a certain recollection about those window sills. The recollection was that the sills were so high one could not look through the windows without pulling himself up. Waking or sleeping, wherever he went during those forty-odd years, that recollection was with the man, though he did not know it. During this time, the substance of his body, including his brain, had changed several times, but the little peoples that live in the cells had not changed. The moment the little peoples in that man's optic

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nerves began to see moving pictures of those old window sills and sent the message back to the brain, some of the little people in the fold of Broca began to stir. They had heard about those window sills before. They were so high that nobody could look through them without pulling himself up!

There may be twelve or fifteen shifts that change about and are on duty at different times like men in a factory. I infer this from the fact that we sometimes have to send for the particular ones that have the records we want. That is what we do, I think, when we cudgel our memories for the things we want to recall. We have forgotten a man's name, for instance. We ask the shift of little peoples who happen to be on duty, "What is that man's name?" They were not on duty when the name was given to them to remember and they don't know. After a while, suggestion or something else summons the shift that has the name and they give it. I therefore take it that the possession of what is called a good memory really means the possession of the ability to summon the particular groups of little peoples who have the records we want. Haven't you noticed that when you get in touch with the right group the thing you want to recall comes crashing into your consciousness with no evidence whatever of impaired vitality? The little peoples, who have remembered perfectly, seem almost to shout at you the information you want. Therefore it seems likely that remembering a thing is all a matter of

getting in touch with the shift that was on duty when the recording was done.

These little intelligences inhabit human bodies just to get experience. They seem to crave it. As I see it, something like this happens: Billions of little peoples, perhaps, come together in a certain individual. Some want to do one thing and some another. Some have high ideals and some have not. For a while, they fight out their differences and then the stronger group takes charge and this group dominates the man's life. If the minority is willing to be disciplined and to conform there is harmony or at any rate something that approximates it. But oftentimes the minority is not willing to conform. It is outraged at what it conceives to be the indignities that the majority heaps upon it. Minorities then sometimes say, "To hell with this place; let's get out of it." They refuse to do their appointed work in the man's body, he sickens and dies, and the minority gets out, as does too, of course, the majority. They are all set free to seek new experience somewhere else.

I should like to think that the recollections of experiences in one human life are carried forward through an endless succession of other lives. If the same little peoples were forever grouped together we should then have immortality and, what is perhaps more important, we should be able to begin each new experience with all the wisdom that we had gained during the ones that preceded it. This, however, is

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not what happens. Each generation is not able to profit from the mistakes of its ancestors. Each generation commits most of the same follies that have been committed since the beginning of time.

Nevertheless, I believe that some of our experiences are carried forward into succeeding generations. How else shall we account for what we may call inherited wisdom? Put your finger in a sleeping baby's hand. What does the baby do? It closes its hand on your fingers. Why? Because some of the little peoples in this baby remember the time when their forefathers lived in trees and it was necessary, to keep from falling and breaking their necks, to close their hands upon the limbs of trees.

What we call "inborn traits" are recollections of earlier experiences that the little peoples have brought along with them. Take an Indian baby, for instance. No matter how hard or how long you may try, you can never make a white man out of that baby. The little peoples in the baby will not permit you to do so. They have their ideas, gained from preceding experiences, of what a human being should do. You may repress these little peoples to the point where you believe you have made an Indian into a white man, but, when you least expect it, they will jump out at you and startle you with a war whoop. Of course, what you do to the red little peoples will constitute part of the recollections that they will carry on into their next life-experience; and when there have been enough such experiences the Indian's "inborn traits" will have been changed.

That is about the way I look at it. I do not see how there could be any such thing as carrying from one person to another the bulk of the recollections that the little peoples have as they go along. These minute intelligences that carry our records would become so burdened, if they did not forget most of their experiences, that they would have no further capacity for memorizing. And inasmuch as the same little peoples never reassemble in another body, there can be no such thing as the perpetuation of the individual in another earth-life. Such things can happen, as they say, "only in the movies" or in literature. Rudyard Kipling, in one of his best stories, had a London bank clerk get a glimpse of a former incarnation when he was a Greek galley slave. That was literature, but it was not science.

III-21-1925

XXXX · MEMORY UNITS

IF MY THEORY IS CORRECT—that the machine called man is only a mass of dead matter and that the real life is in the millions of individual units which navigate this machine, and if on the destruction of the machine these individual units keep together, including those which have charge of memory (which is our personality)—then I think it is possible to devise apparatus to receive communications, if they desire to

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make them. It will be very difficult, as each individual unit, as to size, is beyond the limit of our present microscopes.

When I was a little boy, persistently trying to find out how the telegraph worked and why, the best explanation I ever got was from an old Scotch line repairer who said that if you had a dog like a dachshund long enough to reach from Edinburgh to London, if you pulled his tail in Edinburgh he would bark in London. I could understand that. But it was hard to get at what it was that went through the dog or over the wire.

II-8-1921

XXXXI · THE MYSTERY OF LIFE

I BELIEVE all the old and accepted theories of the origin of life to be fundamentally wrong.

Down in Florida, where I have a place, there is a bush which grows in the ocean—that is, it seems to be a bush. Really it is animal matter built into bush form by the efforts of thousands of insects; it is the work of highly organized individuals massed in a crowd for the purpose of the building. The uninformed who see it, native whites and negroes, believe this insect-aggregate to be a vegetable individual—a sea-tree.

Almost all men, even those whom we accept as best informed, make a similar mistake with regard to that which we denominate as a man, or a cat, or an

elephant. We think the man a unit, that he is just a man; we think the cat a unit, that it is just a cat; we think the elephant a unit, that it is just an elephant.

I am convinced that such thinking is basically in error. Like the "bush" in the sea near my Florida home, the man, the cat, the elephant are collections of units. The insect-built "bush" seems to be a unit, an individual. The man does. The cat does. The elephant does. But it is only seeming.

Each is made up of many individuals gathered in a community, and it is the community. The unit which makes it up may be too small even for the microscope to see. Everything which we can see is a manifestation of community, not of individual effort.

The mystery of life would be inexplicable were it not for this. We say a man dies. Perhaps, in a sense, the term is accurate when the aggregate which we have called a man ceases to function as an aggregate and therefore no longer can be called a man; but the expression is not at all accurate if by it we mean that the life which kept that man at work or at play ceases to exist. Life does not cease to exist.

The life-units which have formed that man do not die. They merely pass out of the unimportant mechanism which they have been inhabiting, which has been called a man and has been mistaken for an individual, and select some other habitat or habitats. Perhaps they become the animating force of something else or many other things.

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The theory which generally maintains about the origin of life seems to me to be unreasonable. We can't get something out of nothing. Life can't make life. Life is. It is not made.

Another thing which continually puzzled me, for a long time, was that nature seemed to be so horribly cruel. I could not acount for it. Finally, I have come to the conclusion that it is not true.

It is only apparent. Really those things which seem to be manifestations of nature's cruelty are merely episodes of competition between groups which covet one another's machines, one feeling that the possession of another's might help it better to meet the exigencies of the environment with which it finds itself surrounded. Take the supposed cruelty of the shark toward the cod for example; it probably is the effort of the vast swarm of individuals which make up the shark to obtain for its own purposes the mechanism of the group which inhabits the cod, has built the cod, and has given it the appearance and the functions of what we call "individual life." Real life is not lost at all in such a struggle. Thus, I believe that really it is not cruelty at all when the battle brings a complete and not merely a partial victory, when the victim is "killed," as we erroneously say and think, and not wounded and left "living" and in pain.

That is the only theory which seems reasonable to me with regard to that which we have denominated the "life-and-death struggle."

Then, if the individual is not the unit, what is? Obviously, the unit must be the smallest complete entity among those which make up the aggregate which we erroneously have called the individual. Very well. Then how small can a unit be and how complicated?

That must depend upon the fineness of matter. Smallness of units must accord with the ultimate fineness of matter. And life is individual to the unit and not to the aggregate of units. It is probable that the units are so small that, as yet, no microscope powerful enough to distinguish them as individuals has been created.

If we accept this as fact, another question arises: Is matter fine enough to permit units of such minute size to be very complicated?

We need not worry about that. The electron theory gives to it a reply which is wholly satisfactory. I have had the matter roughly calculated mathematically and have at hand the data of the calculation. I am sure that a highly organized entity, consisting of millions of electrons, still remaining too small to be visible through any existing microscope, is possible.

Ink your finger, as the police might that of a criminal, and then press it upon paper, thus recording the many tiny whorls which indent its skin. Then seriously burn it, so as to take the skin all off, and when it heals—that is, when the skin forms anew—ink it again and again press it upon paper. It will record whorls precisely similar to those which you had burned

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away. Who built the new in duplicate of the old? Nature?

No. Nature would not take the trouble to remember such unimportant details. The new were built by the units of the swarm, and the exactness with which the old were reproduced is due to the fact that the swarm has memory.

If a bridge falls, we rebuild it. If there should come along an outsider, say, a man from Mars with eyes so coarse in their functioning (a reasonable thought) that he could not see anything so small as a human workman, but acute enough so that he could see the the ruins of the old bridge and the new structure erected to take its place, he would say that the old bridge had died and nature had grown a new one. Again, if this creature, unable to see anything as small as a man, but able to see big things, like our larger ships and say, sky-scrapers, were to examine our world, he would think the ships and sky-scrapers were natural growths. He never would dream that man had built them, for he never would be able to see man. The fact that we attribute to nature so many creative achievements is proof of our ignorance and the inadequacy of our power of observation.

The individuals in the aggregate which we call a "man," the members of the swarm which (to some extent by chance) have collected to make that man, are ninety-five per cent workers and five per cent directors. The workers cannot loaf or stop, even

though something may compel them from their habitat, that which has been the "body" of a "man." They must go to something else to build, as, for instance, to corn, a tree, grass—whatever may be—always working under the direction of the higher type among them. These, by the way, will be responsible, as they dominate or fail to, or in accordance with their aspirations, for the character of that which now is built.

In the case of a "man," for example, he may be "bad" or "good," in accordance with the trend of these dominant individuals or in accordance with the majority quality of the individuals which have gathered, more or less by chance, in the swarm which makes him up. He is "good" if "good" individuals are more numerous in it and dominate, and "bad" if the reverse occurs. The theory explains many things. Among these is the hitherto mysterious force called the "subconscious mind."

Instances of startling ability, such as that, for example, which characterizes a Rockefeller, are beginning to indicate to me the chance gathering into swarms of individuals in which qualities of a certain kind are paramount.

In the institute which bears the Rockefeller name, and which, by the way, was endowed with some of the millions which the collective genius of the assembled Rockefeller intelligence has gathered, parts of a chicken "killed" years ago—that is to say, then dis-

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membered so completely that, were the old beliefs accurate, the process must have caused death and must have been followed by decay unless some method of artificial preservation had been resorted to—still "live" and "grow" in gelatine-filled glass jars provided for the purpose of the experiment. The cells—that is, the communes or groups of individuals which originally built that chicken—still are sending out workers, and these continue building. This is because the environment surrounding them is kept constantly favorable to their work despite the "death" of the "individual"—the aggregate called a "chicken."

Now, let us think about that chicken's origin. The accepted age-old theory is that it was the development of an egg to which the life of the mother hen had imparted part of itself, and that this developed until, within the egg, an embryonic chick was formed, which, growing, became perfect and strong, broke the shell, and appeared, a fully developed baby fowl. As a matter of fact, if the theory upon which I work is accurate, the egg from which the chicken came held the nucleus indeed, but held nothing which could be responsible for all that afterward brought about the formation of the chicken. That, I am beginning to believe, entered this egg from the outside.

It is generally contended that all which is necessary in order that a chicken may be built is fertilized egg, and that, under favorable conditions, this egg develops into the chicken through the working of forces

within itself. I do not believe this. I believe that what I have called a "swarm," liberated from something else, finds this nucleus from the outside, and, accepting it as its new home, goes into it and starts to build this or that kind of chicken according to the indication of the nucleus.

Then comes the inevitable question: "Can life come out of life in unlimited reproduction?" Already I have expressed a negative opinion, with regard to this by saying: "Life can't make life. Life is." I do not believe the affirmative reply, which so generally is accepted. Had that affirmative theory been accurate, the earth long since would have been covered and smothered with all kinds of life. It is obvious that there must be some limit to reproduction. "Bad years" and "good years" for corn, for instance, could not explain the situation as it really is.

We don't know what the units of life are or what the requisites of their existence. It may be that they can live and prowl about in the ether of space and do not in the least require our atmosphere or soil. If so, earth-life can have accessions from the mysterious realms beyond our atmosphere. Probably that is how we got here in the first place, how life got here. The thought that life originated on this insignificantly little and comparatively unimportant sphere to me seems inconceivably egotistical.

As a matter of fact, the manner of the genesis of life upon this earth, I think, was this: After the earth

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cooled of the great heat of its assemblage, life-units came to it through space, into which they had been thrown from some other more developed sphere or spheres. Reaching the earth, they adapted themselves to the environment they found here; and then began the evolution of the various species as we have them, each "growing" individual being a collection of cell-communes.

I think this theory will explain special abilities better than any other. It will rid the world of harmful superstitions such as those of spiritualism. It will bring order out of the chaos of much of that puzzlement which we endeavor to accept as reasoning with regard to the creation and the genesis of man.

I have spoken about extraordinary developments of so-called genius in individuals. Special ability must result if, by some fortuitous chance, a collection, or swarm (I find myself accepting that word as descriptive) chances to be made up of entities of very high class along one particular line. Affinity, the attraction of like for like, probably plays its part in the formation of such collections. There have been hundreds of cases of extraordinary significance.

Another question which must be answered before I can proceed on the intelligent development of this theory is: "Could such a little thing as I have in mind travel through the ether of space or only through the air?" If it could travel through the air only, then its progress would be slow. If it could travel through the

ether, it could proceed at the rate of a hundred and eighty thousand miles a second, going a distance equivalent to the circumference of the earth in one-four-hundred-and-twentieth of a minute. There, as elsewhere in the general problem, is work for a mathematician who is very expert.

There is work here, also, for an expert botanist, because the line between animal and vegetable life is so very narrow. And there remains for determination the line between "live" and "dead" matter and between movable and fixed life.

In the early moments of this paper, I spoke about what seems to be but is not a "sea-bush" that grows in the water near my winter place in Florida. A certain class of organized, living beings, large enough even to be seen with the naked eye, builds structures which appear to be but are not plants, being nothing more nor less than swarms of insects gathered in that form in order that they may get food conveniently. Consider the sponge. It seems vegetable, but is animal. Investigate further, and you will find it to be an aggregate which has been built by a group of insects.

It is impossible to accept as fact all the apparent testimony of appearances. In geological ages, all of a certain type of crustacean creatures suddenly disappeared, and quite a different type came into being. The swarms that had built the first had not been annihilated, but the environment had changed, and, in order to meet its new conditions, they built mecha-

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nisms of another pattern. One mechanism has been replaced by another of a different type many times in the world's history. Changed conditions not only require but force new forms. When a new environment replaces an old one, old forces build in new ways, in order to adapt themselves to altered circumstances.

Doubtless something of the sort will happen many times again. Certain animals that we know much about have been changed entirely in order to meet altered environment, and of this we have incontrovertible evidence. For instance, the elephant used to be a woolly beast. He ceased to be. He didn't change himself. The animal doesn't know anything about such changes. It is the group which changes him, working quite beyond his consciousness. The individual members of the swarm—that is, its leaders—realize the new necessities and begin to meet them gradually and with invariable intelligence. They stop building the old forms; they stopped building wool on the outside of the elephant when the elephant's environment became tropical. When the swarm finds wool unnecessary, wool, then, is dispensed with.

Swarms do it all. The daisy has been the same for, say, fifty thousand years. Then comes a variation. Perhaps the daisy becomes blue. How could one daisy do that? Some disturbance of the swarm that built that daisy must be responsible for the change.

The absurdity of our present theories seems pitiful

to me. "Nature does it!" What of that remark? It really means nothing, takes us nowhere. Botanists and allied scientists may prove me to be all wrong in saying that. That will not worry me if they will produce something which really will be reasonable. It will take thought, deep thought, and that high mathematical skill which I have mentioned to discover how many individuals can live in each cell; for a cell cannot be the unit of organized matter; it must be a group of organisms—a fixed commune.

I want some one to start along a new line of thought with regard to these and kindred subjects. We have been accepting old-established theories with a complacency unworthy even of our present imperfect mental grasp. We need fresh brain-energy among our scientists, new bravery, new initiative. Einstein has shown the world the sort of thought it needs, and it needs it along many lines. The more Einsteins we can get, the better. I wish we had an Einstein in every branch of science.

Many great discoveries remain to be made. We must start anew in many things, rejecting the old theories as Einstein did, building along new lines as Einstein did, fearing nothing any more than Einstein did.

It is not impossible that, when we find the ultimate unit of life, we shall learn that the journey through far space never could harm it and that there is very little that could stop it. Remember that it is smaller,

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infinitely, than anything the microscope can see. I believe the ultimate life-particle could go through glass with the greatest ease, and that not the highest or the lowest temperature known to human science could harm it. Such units of life could have come, and possibly still are coming, without injury through the cold of space. We know of microbes which will endure through four degrees above absolute zero, and some are so small that they can be forced through porcelain.

We human beings are colloids, not crystals; and we are in the best possible general environment for colloids. We never use crystals in our body-building if we can avoid them.

It is quite conceivable that these entities with which life starts have intelligence sufficient for the initiation of new lines of endeavor from time to time, as occasion or necessity for new lines arises. There is that hairless elephant; there is that blue daisy; there are countless changed and changing forms. That is the De Vries theory, which opposes the Darwinian theory of the origin of species.

The little entities are fine chemists. They can make an alkali so strong that it will displace from its salts the chemist's master alkali, potassium, and they must be close to ultimate matter, for they decompose salt into sodium and hydrochloric acid. Obviously, it will take great chemical as well as great mathematical knowledge to cope with the problems which they

offer, but the world has, or will have, men who can do it. Even now there is the wonderful Japanese, Takamini, who discovered adrenalin, that extraordinary astringent which is manufactured by a gland and controls blood-pressure.

There is a significant instance, an illustration! It is the product of a gland, not an effort of intelligence, which controls blood-pressure. The brains of men have little to do with the control of the bodies of men. Tell me that our brains are the sole seat of our intelligence? Why, seven-tenths of the action of our bodies is quite automatic—that is, entirely beyond and dissociated from brain-control. The brain does not control the circulation of the blood, the action of the lungs, stomach, or bowels, growth of any of the vital processes. It is controlled by them. Nothing could be more absurd than to regard the brain as the exclusive seat of knowledge. Knowledge is everywhere throughout our being and throughout all other beings, inanimate, perhaps, as well as animate.

It is everywhere. In the animal, human or otherwise, the head is merely the chief office in which orders are originated and from which they are distributed. The five senses realize, understand, and meet the conditions which exist outside the body. The brain is occupied by the high-class workers. They have charge. The balance are, I might say, the proletariat. But it is dangerous (as many politicians

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have discovered) to assume that any proletariat is without intelligence. Those among this proletariat who show special ability may achieve promotion, moving upward to the higher tasks, I think, as men developing special talents in industry may move upward. Perhaps it is this process which slowly is making us more civilized.

Now, I shall express another thought which may seem startling. I believe these swarms, or, at least, the individuals which make up these swarms, live forever. Individuals among the entities which form them may change their habitat, leaving one swarm and joining another, so to speak, building corn, for instance, to-day and chickens to-morrow, in accordance with the material which they find at hand to work with. It is not impossible that the chief workers may keep together, from time to time changing their environment as circumstances may dictate, but I think evidence exists that the workers separate when a job on which they have been occupied is finished, and go to find new tasks with little or no regard for old companionships. This simply is a repetition, and perhaps the fundamental pattern of those processes which we find necessary in our ordinary lives. The personality-swarm abides within the fold of Broca, which, from eighty-two surgical operations, is known to be the seat of memory. If this swarm keeps together after body-death, our personality still lives.

It is the most complicated of subjects, opening up

very novel lines of reflection. That thought of the swarms is fascinating. A swarm, any swarm, easily might contain beings which knew how to build us as we were when we were chimpanzees or even as we were when we were fishes; I understand that in one period while we are in embryo we have the gills of fish, which slowly slough away before our actual birth.

I think it is certain that, if our environment in future changes as materially as it has in the past, alterations as great as that from fish to man and from gills to noses will occur in the course of future ages. Then what shall we be?

I have very vivid recollections of a motor journey through Switzerland not long before the World War began. As it progressed, I saw the effect of environment upon myself. If we went to a hotel in a small town far from steam- or water-power, and therefore without electric light, we found everyone in it going to bed at half-past eight or nine o'clock. In other towns, where there was electric light, product of developed water-power from the Alps, the people didn't go to bed till half-past eleven or midnight. They were alive and very likely out on the streets during those extra hours. We are virtually dead when we are asleep; that is, we then have no productive mental life, and no mental life which is not productive counts. Where there was light, we lived longer in the same length of time. Put a developed human

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being into an environment where there is no efficient artificial light and he must degenerate. Put an undeveloped human being into an environment where there is artificial light and he will improve.

Environment makes immense changes in animals, and it is interesting and hopeful to note that the environment of human beings is improving more rapily than that of other animals. Perhaps, for an ant or a gnat, it is not changing at all, although primary changes are progressing in the world itself. Earthquake shocks, like those which recently occurred in Mexico, prove that the world is shrinking. They are the convulsions attending permanent alterations in the earth's size and shape, and indicate the release of strains.

V-1920

XXXXII · SPIRITUALISM

A GREAT DEAL is being written and said about spiritualism these days, but the methods and apparatus used are just a lot of unscientific nonsense. I don't say that all these so-called mediums are simply fakers scheming to fool the public and line their own pockets. Some of them may be sincere enough. They may really have gotten themselves into such a state of mind, that they imagine they are in communication with spirits.

I have a theory of my own which would explain scientifically the existence in us of what is termed

our "subconscious minds." It is quite possible that those spiritualists who declare they receive communications from another world allow their subconscious minds to predominate over their ordinary, everyday minds, and permit themselves to become, in a sense, hypnotized into thinking that their imaginings are actualities, that what they imagine as occurring, while they are in this mental state, really *has* occurred.

But that we receive communications from another realm of life, or that we have—as yet—any means, or method, through which we could establish this communication, is quite another thing. Certain of the methods now in use are so crude, so childish, so unscientific, that it is amazing how so many rational human beings can take any stock in them. If we ever do succeed in establishing communication with personalities which have left this present life, it certainly won't be through any of the childish contraptions which seem so silly to the scientist.

I have been at work for some time building an apparatus to see if it is possible for personalities which have left this earth to communicate with us. If this is ever accomplished, it will be accomplished, not by any occult, mysterious, or weird means, such as are employed by so-called mediums, but by scientific methods. If what we call personality exists after death, and that personality is anxious to communicate with those of us who are still in the flesh on this earth, there are two or three kinds of appa-

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ratus which should make communication very easy. I am engaged in the construction of one such apparatus now, and I hope to be able to finish it before very many months pass.

If those who have left the form of life that we have on earth cannot use, cannot move, the apparatus that I am going to give them the opportunity of moving, then the chance of there being a hereafter of the kind we think about and imagine goes down.

On the other hand, it will, of course, cause a tremendous sensation if it is successful.

I am working on the theory that our personality exists after what we call life leaves our present material bodies. If our personality dies, what's the use of a hereafter? What would it amount to? It wouldn't mean anything to us as individuals. If there is a hereafter which is to do us any good, we want our personality to survive, don't we?

If our personality survives, then it is strictly logical and scientific to assume that it retains memory, intellect, and other faculties and knowledge that we acquire on this earth. Therefore, if personality exists, after what we call death, it is reasonable to conclude that those who leave this earth would like to communicate with those they have left here. Accordingly, the thing to do is to furnish the best conceivable means to make it easy for them to open up communication with us, and then see what happens.

I am proceeding on the theory that in the very nature of things, the degree of material or physical power possessed by those in the next life must be extremely slight; and that, therefore, any instrument designed to be used to communicate with us must be super-delicate—as fine and responsive as human ingenuity can make it. For my part, I am inclined to believe that our personality hereafter will be able to affect matter. If this reasoning be correct, then, if we can evolve an instrument so delicate as to be affected, or moved, or manipulated—whichever term you want to use—by our personality as it survives in the next life, such an instrument, when made available, ought to record something.

I cannot believe for a moment that life in the first instance originated on this insignificant little ball which we call the earth—little, that is, in contrast with other bodies which inhabit space. The particles which combined to evolve living creatures on this planet of ours probably came from some other body elsewhere in the universe.

I don't believe for a moment that one life makes another life. Take our own bodies. I believe they are composed of myriads and myriads of infinitesimally small individuals, each in itself a unit of life, and that these units work in squads—or swarms, as I prefer to call them—and that these infinitesimally small units live forever. When we "die" these swarms of units, like a swarm of bees, so to speak, betake them-

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selves elsewhere, and go on functioning in some other form or environment.

These life units are, of course, so infinitely small that probably a thousand of them aggregated together would not become visible under even the ultra-microscope, the most powerful magnifying instrument yet invented and constructed by man. These units, if they are as tiny as I believe them to be, would pass through a wall of stone or concrete almost as easily as they would pass through the air.

The more we learn the more we realize that there is life in things which we used to regard as inanimate, as lifeless. We now know that the difference between the lowest-known forms of animal life and trees or flowers or other plants is not so very great.

Small as these units of life are, they could still contain a sufficient number of ultimate particles of matter to form highly organized entities or individuals, with memory, certain varieties of skill, and other attributes of living entities. We, in our ignorance of all that pertains to life, have come to imagine that if certain things happen to a human being or an animal its whole life ceases. This notion has been repeatedly disproved in recent years.

The probability is that among units of life there are certain swarms which do most of the thinking and directing for other swarms. In other words, there are probably bosses, or leaders, among them, just as among humans. This theory would account for the

fact that certain men and women have greater intellectuality, greater abilities, greater powers than others. It would account, too, for differences in moral character. One individual may be composed of a larger percentage of the higher order of these units of life than others. The moving out of myriads of what we may call the lower type of units of life and the influx of myriads of units of a higher order would explain the change which often takes place in the personality and character of individuals in the course of their existence on this earth.

The doctors long ago told us that our whole bodies undergo complete transformation every seven years, that no particle that entered into the composition of our bodies at the beginning of one seven-year period remains in our bodies at the end of seven years later. This means that matter is discarded, new matter being replaced by the working life-units or individuals. This rough-and-ready way of describing the discarding of defective matter that is constantly going on in our make-up would not be inconsistent with the theory I have evolved.

A common saying is, "We are creatures of environment." This is true, at least up to a certain point. We have seen how environment has wrought changes upon animals, and even wiped out certain species altogether—as the discovery of numerous skeletons of mammoth animals of prehistoric days has proved. Units of life, it is perfectly reasonable to deduce,

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require certain environment to function in certain ways, and when environment undergoes complete change, they seek other habitats, other dwellings, so to speak, for the carrying on of their functions.

Numerous experiments conducted by medical scientists have revealed that the memory is located in a certain section of the human brain called the fold of Broca. Now, to return to what is called "life after death." If the units of life which compose an individual's memory hold together after that individual's "death," is it not within range of possibility, to say the least, that these memory swarms could retain the powers they formerly possessed, and thus retain what we call the individual's personality after "dissolution" of the body? If so, then that individual's memory, or personality, ought to be able to function as before.

I am hopeful, therefore, that by providing the right kind of instrument, to be operated by this personality, we can receive intelligent messages from it in its changed habitation, or environment.

X-1920

XXXXIII · SPIRIT COMMUNICATION

I CANNOT conceive of such a thing as a spirit. Imagine something that has no weight, no material form, no mass; in a word, imagine nothing. I cannot be a party to the belief that spirits exist and can be seen under certain circumstances, and can be made to tilt tables and rap chairs and do other things of a

similar and unimportant nature. The whole thing is so absurd.

I have been thinking for some time of a machine or apparatus which could be operated by personalities which have passed on to another existence or sphere. Now follow me carefully; I don't claim that our personalities pass on to another existence or sphere. I don't claim anything because I don't know anything about the subject. For that matter, no human being knows. But I do claim that it is possible to construct an apparatus which will be so delicate that if there are personalities in another existence or sphere who wish to get in touch with us in this existence or sphere, this apparatus will at least give them a better opportunity to express themselves than the tilting tables and raps and ouija boards and mediums and the other crude methods now purported to be the only means of communication.

In truth, it is the crudeness of the present methods that makes me doubt the authenticity of purported communications with deceased persons. Why should personalities in another existence or sphere waste their time working a little triangular piece of wood over a board with certain lettering on it? Why should such personalities play pranks with a table? The whole business seems so childish to me that I frankly cannot give it my serious consideration. I believe that if we are to make any real progress in psychic investigation, we must do it with scientific apparatus

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and in a scientific manner, just as we do in medicine, electricity, chemistry, and other fields.

Now what I propose to do is to furnish psychic investigators with an apparatus which will give a scientific aspect to their work. This apparatus, let me explain, is in the nature of a valve, so to speak. That is to say, the slightest conceivable effort is made to exert many times its initial power for indicative purposes. It is similar to a modern power house, where man, with his relatively puny one-eighth horse-power, turns a valve which starts a 50,000-horse-power steam turbine. My apparatus is along those lines, in that the slightest effort which it intercepts will be magnified many times so as to give us whatever form of record we desire for the purpose of investigation. Beyond that I don't care to say anything further regarding its nature. I have been working out the details for some time; indeed, a collaborator in this work died only the other day. In that he knew exactly what I am after in this work, I believe he ought to be the first to use it if he is able to do so. Of course, don't forget that I am making no claims for the survival of personality; I am not promising communication with those who have passed out of this life. I merely state that I am giving the psychic investigators an apparatus which may help them in their work, just as optical experts have given the miscroscope to the medical world. And if this apparatus fails to reveal anything of exceptional interest, I am afraid that I

shall have lost all faith in the survival of personality as we know it in this existence.

I believe that life, like matter, is indestructible. There has always been a certain amount of life on this world and there will always be the same amount. You cannot create life; you cannot destroy life; you cannot multiply life.

The question has been raised that if these life entities are so small, they cannot be large enough to include a collection of organs capable of carrying on the tasks which I am about to mention. Yet why not? There is no limit to the smallness of things, just as there is no limit as to largeness. The electron theory gives us a reply which is wholly satisfactory. I have had the matter roughly calculated and have at hand the data of the calculation. I am sure that a highly organized entity, consisting of millions of electrons yet still remaining too small to be visible through any existing microscope, is possible.

There are many indications that we human beings act as a community or ensemble rather than as units. That is why I believe that each of us comprises millions upon millions of entities, and that our body and our mind represent the vote or the voice, whichever you wish to call it, of our entities.

Of course, you say, it is nature. But what is nature? That seems to me to be such an evasive reply. It means nothing. It is just a subterfuge—a convenient way of shutting off further questioning by merely giv-

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ing an empty word for an answer. I have never been satisfied with that word "nature."

The entities are life, I again repeat. They are steady workers. In our bodies these entities constantly rebuild our tissues to replace those which are constantly wearing out. They watch after the functions of the various organs, just as the engineers in a power house see that the machinery is kept in perfect order. Once conditions become unsatisfactory in the body, either through a fatal sickness, fatal accident or old age, the entities simply depart from the body and leave little more than an empty structure behind. Being indefatigable workers, they naturally seek something else to do. They either enter into the body of another man, or even start work on some other form of life. At any rate, there is a fixed number of these entities, and it is the same entities that have served over and over again for everything in this universe of ours, although the various combinations of entities have given us an erroneous impression of new life and still new life for each generation.

The entities live forever. You cannot destroy them, just the same as you cannot destroy matter. You can change the form of matter; but of gold, iron, sulfur, oxygen and so on, there was the same quantity in existence in the beginning of this world as there is today. We are simply working the same supply over and over again. True, we change the combinations of these elements, but we have not changed the relative quantities of each of the elements with which we started. So with the life entities, we cannot destroy them. They are being used over and over again, in different forms, to be sure, but they are always the same entities.

The entities are so diversified in their capabilities that it is difficult to identify their handiwork in all instances. Thus today the scientists admit the difficulty of drawing a line of demarcation indicating where life ends and inanimate things begin. It may be that life entities even extend their work to minerals and chemicals. For what is it that causes certain solutions to form crystals of a very definite and intricate pattern? Nature! But what is nature? Is it not fair to even suspect that life entities may be at work building those crystals? They don't simply happen. Something must cause certain solutions always to form certain kinds of crystals.

Now we come to the matter of personality. The reason why you are you and I am Edison is because we have different swarms or groups or whatever you wish to call them, of entities. After eighty-two remarkable surgical operations the medical world has conclusively proved that the seat of our personality is in that part of the brain known as the fold of Broca. Now it is reasonable to suppose that the directing entities are located in that part of our bodies. These entities, as a closely-knit ensemble, give us our mental impressions and our personality.

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I have already said that what we call death is simply the departure of the entities from our body. The whole question to my way of thinking, is what happens to the master entities—those located in the fold of Broca. It is fair to assume that the other entities, those which have been doing purely routine work in our body, disband and go off in various directions, seeking new work to do. But how about those which have been directing things in our body? Do they remain together as an ensemble or do they also break up and go about the universe seeking new tasks as individuals and not as a collective body? If they break up and set out as individual entities, then I very much fear that our personality does not survive. While the life entities live forever, thus giving us the eternal life which many of us hope for, this means little to you and me if, when we come to that stage known as death, our personality simply breaks up into separate units which soon combine with others to form new structures.

I do hope that our personality survives. If it does, then my apparatus ought to be of some use. That is why I am now at work on the most sensitive apparatus I have ever undertaken to build, and I await the results with the keenest interest.

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