Physico-Clinical Medicine

AND

CLINICS OF DR. ALBERT ABRAMS

VOL. 10 AUGUST and SEPTEMBER 1926 Nos. 6 & 7

Founded by
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Published by
COLLEGE OF ELECTRONIC MEDICINE
Blanche and Jeanne R. Abrams Memorial Foundation
1547 JACKSON STREET
San Francisco, California

LAST ISSUE

FAREWELL TO OUR READERS.

With this issue the Journal of Physico-Clinical Medicine bids farewell to its many loyal readers, and takes its place with the Journal of the A E R A and the McManis Journal in creating one unified channel of information for all the electronists. Many will feel that the passing of this Journal is almost like the passing of a great personality or a tradition from our midst. Founded by Dr. Albert Abrams himself, it seems almost like the passing of his own voice—and viewed sentimentally, that is so. But the members of the Board of Trustees of the College at San Francisco set all sentiments aside when they adopted the broader and only sane view of the matter, that the Electronists in the field must be served in the best way possible, that all information must be gathered and given to them through a common channel so that all men could have the benefit of all new thoughts and developments in ERA. It was their intention to unify the Electronists and the Electronic work, and this is one of the ways in which it is being accomplished.

Three Journals in our rather small field meant much duplication both of reading matter and expense to the readers and publishers. Often one would find the same articles in two or all three of the Journals, so that the value of each was somewhat lessened, and at the same time each Journal contained something of value which the others did not. This meant one had to subscribe to all three of them in order to keep himself fully informed—an unnecessary expense to the doctor, which is now eliminated.

In the new Journal precedence will be given to all scientific articles and reports of advance research work from the various Electronic Research Laboratories. Under a common editorship only the best will be published, consequently the standard of this one Journal can be kept much higher than that of any of the three individually. The College of Electronic Medicine will have its own department and in it all progress and new developments from the College Laboratory will be reported, so that we will still have a direct contact with all of our present readers, and at the same time gain contact with many new ones. This really broadens the present scope and field of influence. There is, therefore, no room for false sentimentality. We are all working in a common cause, and through combined efforts, and through a common medium we can speed the attainment of our goal.

The editor takes great pleasure in the privilege of joining with the editors of the Journal of the A E R A and the McManis Journal in the work of carrying on the pages of our new combined herald of ERA.—(Editor).

DR. MOORE RESIGNS.

A Message to ERA Physicians.

We are glad of the opportunity at this time to be able to give to the ERA world Dr. Moore's parting remarks. They help to understand the man whom few understood and the handicaps under which he accomplished so much.—(Editor).

"The leader for the time being, whoever he may be, is but an instrument. It is a little matter whether any one man fails or succeeds; but the cause shall not fail, for it is the cause of mankind."

This was sentiment expressed by Roosevelt and serves to emphasize that the interests of no one man can be considered above the cause. The work and the cause must always come first.

So it is here at the College of Electronic Medicine; the work of the great Albert Abrams must have the first consideration for the development of his discovery is the important thing for mankind. Dr. Abrams' bequests, while greatly lessened by litigation, are now safely invested. The assets must be conserved and the income carefully guarded.

It has taken over two years to accomplish that for which I came here. March 18th, 1924, I was urged to accept the Presidency and had to make decision within the hour. Things were in a distressing condition and immediate action was required. The deep friendship I had enjoyed with Dr. Abrams was appealed to, and I accepted the office. Conditions required that I remain in San Francisco from that hour and Mrs. Moore was forced to take charge alone of closing up our practice and sanatarium work in Portland, Oregon.

The suits over the Abrams property started immediately and with hundreds of disturbed ERA physicians to deal with my hands were completely occupied with the business phase of College matters. Thus it went on for over a year until the suits with the heirs were settled by compromise. Then came the suits by contractors on the new building and after nearly another year we can report that these are all satisfactorily settled by compromise.

The sale of the Sutter Street property required our constant efforts for a full year. No one seemed to want the new building

as it had been planned and in its unfinished state. Then the skies cleared and the Trustees accepted the cash offer of a leading contractor. These funds have now been invested with the greatest care, in securities that are safe and sound. The Trustees went into the matter most carefully with our bankers and the bond house and also with the approval of the State Attorney General.

The time is at hand for me to step aside and I have resigned. I have given the best there was in me. With business matters settled the expense of my office is no longer a necessity—I am very weary and am looking forward to a complete change of environment where I may rebuild health and shape my plans for the future. I wish to slip quietly out of all official capacity and let the splendid men on the Board of Trustees continue to carry on the work.

I cannot speak too highly of the College Trustees and of Attorney Harris. They hold difficult positions and freely give conscientious efforts and much valuable time to the general cause. Under their guidance I have not a doubt in the world but that the College of Electronic Medicine will make marked progress the coming year and will be a great factor in developing ERA.

I feel deeply grateful to the hundreds of ERA physicians who have demonstrated their loyalty during the past two troublous years and I urge the same attitude in the big progressive year ahead.

Sincerely yours,

FRED E. MOORE.

THE RENAISSANCE OF ERA.

A Reply to "The Quack Doctors of Radio."

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Although Fall is approaching, nevertheless the first signs of Spring are here, words are beginning to sprout and ERA has received its first Spring shower of revived abuse. At last we can draw a long breath of relief and say that ERA is returning to its own, because our "dear" critics are again finding it necessary to warn the "dear public" against our evil designs. This time the protectors of mankind arise from the ranks of the radio

world and defend the phantom encroachment by the electronists upon their territories.

In the August issue of Popular Radio, Dr. E. E. Free takes up the cudgels against ERA, and kindred "radio frauds," and for the poor deluded public. His few terse paragraphs will undoubtedly convince every cured ERA patient that he has been faked into his present good health, that his improvement or cure is unscientific and not recognized by the oligarchy of the Radio world. It will undoubtedly make every patient who years ago was told by his "regular" doctor that he would be dead in a few weeks or a few months, and who is alive today, thanks to ERA methods, feel convinced that scientifically he is really dead and that he is cheating the undertakers by not ordering a coffin at once. It will make all the untold thousands of people now well and happy because of ERA therapy, bemoan their unlucky fate at having regained health by such unorthodox means.

The situation created by Dr. Free is no longer tragic, except as it applies to such critics as himself, but only ludicrous. After years of survival against the odds that ERA has met and surmounted, any man of apparent intelligence and scientific understanding who can still make the statements which Dr. Free makes and does not see that something fundamentally true is responsible for that survival and present strength, is, to say the least, in the most charitable terms, slightly blinded by his own learning and brilliance, or else does see and fears that which he sees, therefore rushes to attack. But we will let the Doctor speak for himself. We quote his general introduction and that part of the article which refers to ERA, as it appared in the August issue of Popular Radio. You will notice, as we point out in our discussion below, that nearly every word is a boomerang, born of prejudice, evasion and distortion of the truth, omission of favorable evidence, and gross misconception or ignorance of the subject.

"The human mind delights to believe something that is 'marvelous.' Barnum said that the people like to be fooled. He might have gone farther. They like still more to be fooled scientifically. There is no scientific theory, no matter how utterly unbelievable, but that it has commanded the support and advocacy of someone—usually of many someones.

"Quacks and fakers exist everywhere, but there are more of them on the fringes of science than anywhere else.

"Radio has been an especially fertile field for quackery. Radio itself is so marvelous, so utterly unbelievable until one has grown used to it, that almost any extension of its realities seems reasonable. When one really can sit down at an instrument and listen to someone who is talking a thousand miles away it seems equally easy to believe that one might listen to the inhabitants of Mars or even to the spirits of men long dead. Quacks have not overlooked this opportunity. From the earliest days of radio there have been fakers who used its apparatus and its terminology to impress their victims and to extract money from the unwary.

"THE GREAT ELECTRONIC REACTIONS FAKE DEVISED BY DR. ABRAMS.

1—"An example is the great Abrams fake, a piece of quackery which fooled many and which is still by no means dead, although its inventor is.

2—"Dr. Albert Abrams was a physician of San Francisco, a skillful and well educated man, for years a well-known and reasonably respected practitioner of orthodox medicine. **About ten years ago Dr. Abrams fell from the grace of orthodoxy. He evidently read a book on the electron theory,** which was just then being formulated. He imbibed the **words of this book, as a drunkard imbibes alcohol. Immediately he began to emit their aroma.** Already he had invented a medical procedure called **'spondylotherapy,'** which seems to have been a **method of diagnosis** by feeling the spine with the fingers. This word was a good one but the Doctor found one that suited him better.

"He invented what he called his 'Electronic Reactions.'

3—"These mysterious reactions were a combination of electronic forces with a still more mysterious variety of radio waves, **a variety so mysterious that it never even acquired a name.'** The Abrams procedure of diagnosis made use of two electric machines like ordinary resistance boxes, which, indeed is exactly what they were. Together with these boxes there was a kind of fixed condenser, some wire and a human body. The human body was called the 'subject.' It was on the bared abdomen of this subject that the 'reactions' were made apparent.

4—"A drop of blood was taken from the patient, placed on a bit of filter paper or blotting paper and inserted between the plates of the fixed condenser. The terminals of the circuit were connected to the subject. **Sometimes only one terminal was connected, the other one being left free in the air.** The switches or

plugs of the resistance boxes were set at specified values. **Hard spots were then supposed to appear on the abdomen of the subject.**

5—"These spots indicated, by their appearance and position, whether the blood sample contained the indications of this or that disease.

6—"The connection of all this with radio appeared in the explanation. **It was said that each disease gave off or possessed**—Dr. Abrams was never very clear about this—**certain varieties of electrons. These electrons had definite emanations, apparently conceived as some variety of ether waves.** These waves, quite analogous to radio waves, were supposed to follow the wire, pass through the resistance boxes and affect the stomach of the subject.

7—**"To any experienced radio man this was the completest nonsense. For one thing, there was no source of energy in the circuit,** unless it be supposed to be supplied by the human subject. **The metallic circuit was not complete.** The resistance boxes which were supposed to determine which 'electronic' influence was operating, **altered the 'circuit' in ohmic resistance only, not in any factor which would have affected radio waves even had they been present.** And finally, it was shown by innumerable tests that **no perceptible electric energy of any kind was flowing in the wires of the apparatus.** The only real element of radio in the Abrams procedure was in the words.

8—**"For a time the Abrams fake commanded the interest of many honest men.** Among so many modern marvels anything might have merit. A number of reputable practitioners took it up. **It was seriously investigated by a score or more of scientific and medical agencies. The result was its complete exposure.** It is possible that Dr. Abrams **was a fool rather than a knave.** Be this as it may, he was not a discoverer. He invented nothing but words.

9—"With the death of Dr. Abrams some two years ago his cult declined but it has left **a brood of successors.** One of these is what is called 'chromotherapy.' "

* * * * *

The introduction down to "The Great Electronic Reactions Fake Devised by Dr. Abrams" is only of general interest and serves to impress the Abrams example. In paragraph 2 we have

the first series of misstatements. "He read a book . . . electron theory . . . imbibed words . . . emit aroma," all indicative of the writer's ignorance as to the origin, development and growth of the ERA, and the character of Abrams' fundamental discovery. Farther down we have "Spondylotherapy . . . a method of diagnosis" notice **therapy as a method of diagnosis** and not treatment. Then, paragraph 2, "invented . . . electronic reactions," "invented" for "discovered," a gross misstatement or misconception, equivalent to saying Harvey "invented" the circulation of the blood. Farther along, paragraph 3, we have "mysterious reactions . . . a variety so mysterious that it never even acquired a name." How much in radio with all of its thousands of trained researchers and fully equipped laboratories has a name that means anything, that really defines the forces involved? There are many names that could and have been given these "mysterious forces," but is not the very absence of that one definite name, and the efforts being made, of which Dr. Free is blissfully ignorant, to determine the true character of the forces involved, an indication of the sincere research work being carried on by conscientious workers to solve the many problems?

In paragraph 4 occurs, "sometimes one terminal was connected, the other one being left free in the air," an absolute misstatement, or absolute evidence of ignorance of the facts. Then **"hard spots"** for **dull areas,** more distortion or more ignorance.

Paragraph 6 states "each disease gave off or possessed . . certain varieties of electrons." From what source was the information obtained that "diseases gave off certain varieties of electrons"? What varieties of electrons are there? What more obvious garbling of the hypothesis that these reactions were due to the electronic activity, well established, of the atom and the radiation from it caused by the disturbance of its etheric field?

In paragraph 7 is the statement that "there was no source of energy in the circuit." True, there is no electric battery, no radio broadcasting station, no mule operating a treadmill, but **there is the specimen of blood,** and we claim **that as a source of energy.** Again "The metallic circuit was not complete"—compare its completeness with any radio circuit, and who of the electronists says that it is a metallic circuit? In the same paragraph he states, "altered the circuit in ohmic resistance only." It is a well-known

fact that a series of non-inductively wound coils, such as are used in the reflexophones have minute capacity and inductance effects, and that although resistance is altered, nevertheless it is the latter factors which are called into effect. Farther along in that paragraph occurs, "No perceptible electric energy of any kind was flowing in the wires of the apparatus." No one ever claimed that there was, the fraud is in the imputation of statements to electronists which were created by the critics themselves.

In paragraph 8 we reach the culmination of the series of misstatements and evasions in, "It was seriously investigated by a **score** or **more** of **scientific** and **medical agencies.** The **result** was its **complete exposure.**" Could one state a balder lie than that? **WHAT scientific** (?) and medical agencies investigated ERA and exposed it? The Scientific American? The facts of that joke are too well known. And what Medical agencies? Simmons of the A. M. A.—an ex-advertising woman's specialist? Is he the one whose exposure of ERA is the "score or more" of these agencies referred to? Or perhaps Millikan's exposure? Millikan is a great scientist—true. But his investigation of the ERA machines consisted of looking at the outside of a box **not an Abrams Oscilloclast,** and saying he could tell nothing about it unless examined in his laboratory, and then did not examine it. This and his presence one day at a bill collection trial constituted his investigation and the basis of his report. Since the writer participated in this so-called investigation he is qualified to state these facts. And this is the complete exposure.

But what about the investigations and report of the British Committee headed by Sir Wm. Horder? What about the conclusion of that Committee that the "fundamental claims of Abrams were established to a high degree of probability"? Does that also expose ERA? What about the yearly reports of the Hahnemann Committee? Is that also an exposure of ERA? What about the numerous verdicts favorable to ERA handed down by various Courts in this country and Canada, wherever ERA was on trial? Are they also exposures of ERA? What about the experiences and convictions of hundreds of honest and conscientious practitioners and thousands of benefitted patients? Are they also exposures of ERA? One resents even to take issue on these points, when the criticism is so obviously prejudiced, malicious and blind to the true facts, so oblivious of everything favorable, and so eager to distort and exaggerate everything un-

favorable. Silence is the only dignified answer which such criticism deserves, except for the fact that silence is also distorted and made to serve the devil's purpose.

Now the last paragraph in which, "his cult declined but it has left a brood of successors . . . one . . . chromotherapy." Since when is any other "therapy" "one of the brood of successors" of ERA? What successors has ERA except ERA?

In the words of the immortal Abrams, whom tongues may malign but whom time will acclaim, "Oh, hell, what's the use?"

But never mind—it is the first sign of the Spring of ERA, and the Summer will be a long one.

LAST ISSUE

THE ELECTRON THEORY.

In support of the basis of ERA practice we reprint below two expositions on the Electron Theory of the Atom. The first is an extract from "Modern Theory of Physical Phenomena" by Augusto Righti, Professor of Physics in the University of Bologna; the second is an extract from "The Science of Radio-Activity," by Charles W. Rafferty, London, England. These are not papers from either of these men in any way intended as support for our work. Their clear and logical exposition, however, helps to establish the claims made for the fundamental basis of ERA phenomena in its relation to known and assumed facts, in the realm of physical phenomena in general.—(Editor).

Extract from Professor Righti's Book.

Nothing prevents us from supposing that matter, and hence all known bodies, consist of aggregations of systems of electrons, since the electrons, which may be considered as simple electric charges devoid of matter or as consisting in a modification of the ether symmetrically distributed about a point, perfectly simulate inertia by reason of the laws of the electro-magnetic field and thus show the fundamental property of matter.

Therefore it may be admitted that a material atom is nothing but a system consisting of a certain number of positive and an equal number of negative electrons, and that the latter, or at least some of them, move about the remaining portion like satellites. Molecular and atomic forces would then be nothing but the manifestations of the electro-magnetic forces of the electrons, and the graviation itself might be explained with these concepts as a basis. In fact, this has already been attempted.

If we suppose one or more negative electrons to be taken away from an atom, it becomes a positive ion, while the addi-

tion of one or more negative electrons to a neutral atom produces a negative ion. The manner in which various bodies behave when subjected to free electrons in motion, as in the case of the cathode rays, is such as to indorse the hypothesis. It has indeed been found that a body prevents the passage of electrons, or absorbs the cathode rays, in proportion to its density; that is, in proportion to the total number of electrons which constitute it, independently of the manner in which they are grouped to form chemical atoms of various kinds.

The electrons would seem to be, therefore, the elements of construction in the architecture of the atoms. When such a hypothesis as this is once adopted, the dogma of the invariability of the chemical atom or of the impossibility of the transmutation of chemical substances is forever banished from science, since according to this hypothesis everything is built up of electrons. We have already seen how the phenomena of radio-activity seem to show transformations of this kind.

If, in addition, it is held that all bodies are at least slightly radio-active and hence emit ions and electrons, these new views relative to the structure of matter become quite similar to those which were advanced as the basis of a general explanation of physical phenomena more than half a century ago by a clever and original Italian physicist, Ambrogio Fusinieri. In the existence of which was, on the whole, not much better understood than is the essence of the electrons at the present time.

In order to better understand the importance of the hypothesis and the fundamental attributes of the electrons, it will be well for us to consider synthetically the phenomena due to electrified bodies, either at rest or in motion. Let us say that we bring into contact two bodies of different material and then separate them. They soon present that group of properties which constitute the two opposite electric states and, in particular, they attract each other and create the electric field which surrounds them. If one of the two bodies, say that which has the positive electric properties, is removed to an infinite distance, only the negative body needs to be taken into consideration. If we also suppose it to be very small, the electric field will be represented by rectilinear lines of force arriving at the body from all directions. The surrounding ether is now deformed, giving to this word, the very broadest meaning; that is to say, it exists in a strained condition, which is shown not only by the tensions along the lines of force,

which cause the apparent forces at a distance, but also by the transverse pressures. What the cause of this special state of the ether is, how it can be susceptible of a dual aspect, that is, how it can correspond to a positive and to a negative charge, are questions which we are absolutely unable to answer, just as we are unable to answer the question, what is the real structure and real nature of the entity which exists everywhere and which is called the ether.

Let us now suppose that the small negatively electrified body moves with uniform speed; that is, we will suppose the special state of deformation just defined changes its position in the ether. It may be deduced from Maxwell's theory and from direct experiment as well, that this propagation of the ethereal strain from place to place produces the magnetic field. This may then be considered to be due to a deformation different in nature from the electric deformation but analogous to it, since tensions along the lines of force and pressures in the transverse direction also exist in the magnetic field. And if the motion is rectilinear, the lines of force are circles with their centres on the trajectory and lying in the planes perpendicular to this. A series of electrified bodies following each other with uniform motion has the properties of an electric current. Thus a constant current may be considered as a flow of equidistant electrons in uniform motion and a variable current as a flow of electrons in variable motions, or of electrons which do not follow one another at equal intervals.

If the small electrified body moves with non-uniform motion, the magnetic field which it creates is variable, and the phenomenon of induction takes place. If the motion is periodic, the phenomena of light occurs. Every variation in the velocity of electrified bodies causes a variation in the magnetic field; this produces a variation in the electric field, and these two variations are propagated together with the velocity of light.

Let us now suppose that at a given moment we wish to increase the velocity of the electrified body, which we will suppose to move up to this moment at uniform speed. On account of the relations existing between the electric and magnetic force in an electro-magnetic field, it is not possible to accelerate the motion of the electrified body without the expenditure of energy. In fact, an increase in the velocity results in a variation of the magnetic field, which in turn produces an electric force tending to oppose the acceleration of the motion. In the same way a de-

crease in the velocity is opposed by the generation of an electric force, which tends to conserve the velocity of the electrified particle. In both cases the electromagnetic phenomenon is such as to stimulate inertia, and the body by the mere fact of its being electrified behaves as though its mass were larger than it really is.

What has been said of the small electrified body holds for an electron, and its mass, which we have stated to be less than one-thousandth that of the hydrogen atom, is at least in part not real but apparent.

This species of apparent inertia, which an electrified body or an electron presents, is a manifestation of the phenomenon called self-induction in the case of electric currents. In fact, if there are, instead of a single moving electron, a great number of such electrons following one another at small and equal intervals along the same path, these represent an electric current. An increase or diminution in the velocity of the electrons gives rise to an increase or diminution of the number which pass a given point on the path in unit time, and hence correspond to an increase or diminution in the intensity of the current. Now what has been said about the effect due to the variation in the velocity of a single moving electrified body, or of a single electron, is substantially true of any number of electrons, and thus each variation in their velocity generates a force which tends to hinder the variation itself. Each change in the intensity of the current generates an electromotive force, which tends to oppose the change or to produce a new current in such a direction as to diminish the change. As is seen, this current is the **extra current** and the **electromotive force of self-induction.**

In summing up, it may be said that **the electrons determine the production of the so-called electrostatic phenomena, when they are stationary; of the phenomena of magneto-statics and of constant currents when they are in uniform motion; of electromagnetic phenomena when they move non-uniformly, and of optical phenomena when they move with periodic motion. A sudden variation in the velocity of an electron which may be due, for example, to a collision, generates an electro-magnetic wave in the ether analogous to the waves caused by an explosion in air. The X-ray is the manifestation of these waves.**

We are not in a position to comprehend in what consists the modern hypothesis according to which matter is built up of elec-

trons. First of all, we may admit that the electrons are not matter in the ordinary sense of the word; that is, they do not possess mass other than that which they seem to have by reason of their motion and electric charge. Kaufmann's experiment renders this hypothesis very probable. He found, in fact, that the ratio between the charge and the mass of the moving electrons increases rapidly as the velocity approaches that of light. And since the hypothesis of a varying charge would be too improbable, it only remains to be supposed that the mass rapidly increases. Now such a result as this is in accord with the hypothesis according to which the mass of the electrons is entirely electromagnetic in its origin.

Electrons and the Constitution of Matter.

On account of the facility with which the electron theory lends itself to the formation of a model of the mechanism of physical phenomena, it possesses a decided utility, even in the minds of those who see in it only an instrument for research. In reality, the theory itself is hardly in its initial stages, and it would be premature to consider it just yet as a solid basis for a new system of natural philosophy. Nevertheless, since even from this point of view it is constantly acquiring importance, it will be useful to dedicate this following to a concise exposition of the hypothesis, according to which matter is now coming to be considered as built up of electrons.

A role of fundamental importance is assigned to the electrons in this new mode of conceiving the constitution of bodies; but in order that it may be possible to explain the known phenomena in terms of the electrons, it is necessary to suppose them to be endowed with certain essential properties. Thus, for example, it is held that there exist electrons of two sorts, which are, in a certain sense mutually antagonistic, namely, negative electrons and positive electrons; it is held that the first and not the second may exist in a free state; it is admitted that the separation of a negative electron takes place more easily, or with less expenditure of energy, from certain atoms, like those of the metals, than from others. However, the fundamental property attributed to the electrons is that, in their essence, they consist of electric charges acting on each other in the manner expressed by the formulae of Hertz or Maxwell. It follows from this that the new theory does not pretend to give a reason for the cause of electric

phenomena. This still remains a mystery. While formerly, starting with the existence of cosmic ether and that of ponderable matter, characterized by its principal attribute, inertia, the attempt was made to give a mechanical explanation for all phenomena; now, on the contrary, starting with the ether and the electrons, the attempt is made to construct, so to speak, ponderable matter out of these and to take account of the phenomena which it presents. Hence it may be said that the electron theory is much more a theory of matter than a theory of electricity; or, rather, in the new system of electricity is set up in the place of matter, in spite of the fact that the concepts of this physicist have hitherto been open to objections and have lost a part of their value in the light of subsequently discovered facts, one thinks at once of what he called the attenuated matter emitted by all bodies, when one speaks of emanations sent out by radio-active bodies, or of electrons which, like a species of slow and invisible evaporation, are probably given off in a continuous manner by every material substance, and diffuse into surrounding space.

* * * * *

Extract from Mr. Raffety's Book.

The Electron Theory of the Atom.

The electron theory presents the most comprehensive and consistent explanation of physical phenomena that science has yet been able to offer. Its application is very wide, but it need only be briefly considered here in its relation to radio-activity.

The study of ionization of gases proves that the negative ion (i. e. the electron) is always invariable in character, while the positive ion varies with the nature of the gas in question. This is in accordance with the view that the process of ionization consists of the removal of the electron from the neutral gas atom. The positive ion is therefore the original atom deprived of an electron, and its mass and nature must necessarily be determined by the particular gas ionized. Whatever the nature of the atom be, considered as a whole, at least one electron forms an essential part of it.

It appears certain that all the observed properties of an atom are functions of the electric charge or charges associated with it, and there is every reason to believe that chemical affinity is electrical affinity, explicable by the properties of the electrons associated with atoms.

This is a broad generalization, but although the laws which govern the manifestation of such affinity in any special case may not be accurately known, it seems impossible to doubt that its nature is electrical.

A consideration of the subject of radiation and many of the phenomena met with in optical research, shows the necessity of the existence of electrical charges within, or in close association with, the atom. Light consists of the propagation of electromagnetic wavs in the ether, and a study of the nature of the radiation yields valuable information as to the process occurring within the radiating source.

Spectroscopic analysis not only proves the existence of oscillating charges in close connection with the atoms of the radiating elements, but also that the frequency of the oscillations, which determines the color of the emitted light, is a characteristic of the element in question, and implies that a certain electron system is a distinguishing feature of its atom.

Consideration will show that a theory which assumes the particulate and discontinuous structure of matter involves the necessity for the existence of a medium by means of which the interactions of the particles can take place and their properties be manifested. The only known medium in science which can supply the necessary connecting link is the ether, and one of the facts which physical research has served to establish is that connection between matter and the ether can only be brought about by means of an electric charge. This is very important, for it is the expression of one of the widest possible generalizations.

The association of electrons with atoms in all forms of matter is amply demonstrated, but without reference to any electrons which may be in connection with the atom, and by means of which certain of its properties are manifested, the electron theory also accounts for the atomic system itself and explains not only the relations exhibited in the periodic law of the elements but also the phenomena of radio-activity. The development of the electron theory as applied to the atom is largely due to the work, both theoretical and practical, of Prof. J. J. Thompson (i. e., now Sir J. Thompson).

According to recent views, resulting from much experimental work on the subject, the atom consists of a system of electrons in rapid orbital revolution within a sphere of uniform positive electrification. The number of electrons in the system determines

the weight of the atom, and their configuration and arrangement, its physical properties.

The theory postulates a uniform sphere of positive electrification as a necessary condition for the stability of a system of negative electrons.

In all electrical phenomena the electron plays the active part; its existence proves the particulate nature of negative electricity. Positive electricity, however, never appears apart from matter; that is to say, it is always encountered in inseparable association with the atom, and all attempts to find a positive unit, equal and complementary to the electron, have completely failed.

This has given rise to the statement that electricity is particulate, although, of course, the assertion really refers to negative electricity, which, being free from any necessary material connection, forms the active agent in contrast to the part played by positive electricity, which is passive and apparently incapable of existence or movement apart from the atom. Positive electrification, therefore, under whatever circumstances it may be found, always indicates a deficiency of the electrons necessary for a state of electrical neutrality.

Number of Electrons in the System.

From the knowledge gained from the investigation of the kathode rays, it will be clear that a hydrogen atom must be a system of some eight hundred or a thousand electrons on the assumption that its mass is entirely due to them, and that other atoms represent systems of a complexity indicated by their various atomic weights, an atom of mercury consisting of some 200,000 electrons. At first sight it may appear almost incredible that this vast system can exist within the volume of an atom, but an investigation of the question will show that, not only are the electrons not crowded, but that, on the contrary, they are separated by intervals which are relatively enormous in comparison with the space they actually occupy. Although the matter can be subjected to calculation, an approximate idea will serve, and may be gathered from the statement that if a fairly large lecture hall be taken as representing the volume of the atom, the electrons on the same scale would be represented by bodies about the size of a pea.

The period of revolution of the electrons within the atom is not known with any certainty, and no doubt varies with different

atoms, but it is most probable that several billion revolutions are performed in one second.

In connection with this supposed revolution occurs the very important question as to how it is possible for the atoms to exist for age after age, without the energy of the electrons being exhausted in setting up radiation in the surrounding ether. Calculation shows that a single electron would very quickly lose its energy by radiation, even if it were initially revolving with the enormous speed indicated. It has been shown, however, that the argument which applies to an electron considered singly must be much modified when the case is that of a large number distributed around the circumference of a circle; and in addition to this, there are the unknown factors introduced by the circumstance that the revolution is hypothetically, performed within a sphere of positive electrification.

In support of the idea that the electrons are thus revolving, and do not merely constitute some electro-static formation, the velocities of the electrons forming the B rays may be mentioned.

To suddenly endow an electron with such a velocity would need an incredible concentration of force upon it, for the time in which the velocity would have to be imparted would only be that inconceivably minute fraction of a second during which the electron was flying free of the atomic system. The observed facts seem to point strongly to the conclusion that the velocity of the electron is not due to any such violent acceleration, but to the orbital velocity it already possessed when constituting a part of the atom.

The Electron Theory and the Periodic Law.

In the electron theory of the atom can also be found an explanation of the relations shown in the periodic law, for it seems certain that definite physical and chemical properties are associated with definite arrangements of the electron system, and that the similarity of atomic structure exemplified in the elements of a sub-group is only possible at definite atomic weights. This is well illustrated by an experiment performed with floating magnetic needles in a uniform magnetic field. A number of short magnetic needles are floated on the surface of water by being inserted through small pieces of cork, and are so arranged that like poles are all pointing upwards. They will, of course, repel one another outwards and distribute themselves around the edge of the containing vessel. The approach of the pole of oppo-

site sign of a more powerful bar-magnet from above will attract all the smaller magnets and cause them to draw together against their own repulsions, forming a geometrical figure, the shape of which will depend on their number.

In the performance of this experiment the small magnets are to be considered as representing the electrons, and the field of the large magnet as the sphere of uniform positive electrification.

Observations of the configurations assumed by the small magnetic needles as they are introduced one by one on the surface of the water, will show a series of relations closely analogous to the relations set forth in the periodic law of the elements. As an example of this periodicity the case of four and twelve needles may be taken. Four set themselves in a square, and this figure is not again observed until eight more have been introduced, when it occurs as a central figure with eight forming an octagon around it. Similar relations are noticed with other figures, as in the cases of seven and sixteen. Seven takes the form of a hexagon with one occupying the centre, and this does not occur again until the needles number sixteen, when it is seen as a central figure surrounded by a ring of nine.

Owing to the difficulty of obtaining a large number of needles with a practically uniform intensity of magnetization, the large figures are not always easy to form, but when accurate, the continuation of the periodicity is clearly evident and is very suggestive of a probably analogous scheme of arrangement in the complex systems of electrons which are supposed to constitute the atoms of the elements.

Stability of the Atom.

The fact that the electrons forming the atomic system are in motion does not destroy the value of the considerations suggested by the experiment with the magnetic needles, although it introduces a modifying condition.

The stability of a system of eighteen needles can be totally destroyed by the removal of only one of them, necessitating the complete rearrangement of the entire figure. The question of the cause of instability in an atom is very important. An unstable condition would doubtless result from the withdrawal of a sufficient number of electrons from the system, but it is difficult to see how this could occur except by means of some external

agency. If such removal resulted from forces within the atom, it would itself constitute, not cause, a condition of instability.

The theory which seems most probable, and which has received the greatest support, is that stability is possible in a given atomic system only while the orbital velocities of the electrons are above a certain critical value. A rough analogy is found in a top, which will maintain an upright position only while it is spinning above a certain critical velocity of rotation.

If by any means the orbital velocities of the electrons should be reduced, the atom would remain stable until the critical value was reached, when there would be a sudden rearrangement of the system, and in the process certain electrons or groups of electrons would probably make their escape, flying free from the atom with velocities which would be determined by the conditions of the case.

Possible Cause of Instability.

It is clear that if an electron is performing a periodic movement which will result in the emission of electro-magnetic radiation into the surrounding space, part of its energy must be expended in the process, and it seems quite possible that the atoms of the various elements may be continuously emitting an exceedingly feeble and undiscoverable form of radiation which serves to gradually reduce the velocities of the electrons below the critical value necessary for stability.

In some atoms the velocity will be very much greater than in others, and these will constitute the atoms of the more stable elements, but on this view no atom is eternally stable. According to Prof. Thompson, the condition of instability is marked by the total internal rearrangement of physical properties, the potential energy of the system being decreased and the kinetic energy increased.

Theories of the Atom.

There is no theory of atomic structure at the present time which is entirely satisfactory from all points of view. The one given above, although open to certain objections, offers a scientific and connected explanation of a wonderful range of facts, and, as the value of a theory is directly proportional to its power of explanation, it is the best one to provisionally accept in the theoretical conception and interpretation of radio-activity. It should, however, be remarked that it cannot be considered as

proved, and that the distintegration theory of radio-active phenomena is not necessarily dependent on its validity.

Various other hypothetical conceptions as to the nature of the atom are mentioned in Sir Oliver Lodge's work, "Electrons, or the Nature and Properties of Negative Electricity." The only other of these which need be mentioned here is the one which assumes the atom to consist of a system of electrons revolving around a positive unit of extreme concentration, like the planets round the sun. There are difficulties connected with this conception as with the others. The facts of radio-activity seem practically on this theory, especially with reference to the formation of the various disintegration products, unless it be assumed that the atom consists not only of one positive unit but of several positive units, each with its own system of electrons, on the analogy of a multiple star system. It would then be possible to account for the emission of an —a— particle, which is an atom of small atomic weight with a positive charge, and the simultaneous formation of the atom of radium emanation. On this assumption the indivisibility of the positive unit would occasion no difficulty, as the —a— particle would be considered as one of the hypothetical sub-systems in the multiple system of the atom which had escaped with its own attached electrons. The theory of the possible structure of an atom of matter on the plan of the solar system is dealt with in a most interesting manner by M:. E. Fournier d'Albe in his work, "Two New Worlds." In this work the author endeavors to show the possibility of an atom not only resembling a solar system, but actually being a solar system in an intra-universe which man is able to recognize only as "matter" and although the work is mainly philosophical in its conception, the subject is also treated from the standpoint of physical science.

In connection with the science of radio-activity, however, the electron theory as developed by the work of Prof. J. J. Thompson is assumed as offering the best basis of interpretation.

The ultimate nature of the electron is unknown, and its discussion belongs, for the present at least, more to the realm of metaphysics. It is possible to conceive it as some modified and individualized form of the universal ether of space, but more intimate knowledge of the positive electricity, which is always encountered in connection with the atom, are centres of a region of etheric strain known as an electro-static field, and in which the

imagined lines of force are conceived to exist, but of the internal structure of either there is no definite knowledge, and it seems doubtful if the properties which are outwardly manifested can be considered to exist within the space which, small as it is, they must individually occupy.

LAST ISSUE

PROMPT SERVICE.

E. W. BINKLEY, Office Manager,
College of Electronic Medicine,
San Francisco, California

Habit is the cause of many delays in fulfilling many of the requests from doctors in the field.

For several years Dr. Abrams conducted his business under various names:

Physico-Clinical Laboratory handled all blood examinations.

Physico-Clinical Medicine was the Journal Department.

Physico-Clinical Co. took care of the Oscilloclasts and apparati.

Philopolis Press was the department handling his numerous books.

In July, 1922, Dr. Abrams incorporated the College of Electronic Medicine but up to his death maintained the several departments above mentioned.

After the compromise settlement with the estate of Dr. Abrams the College succeeded to the right and title of all the departments and has endeavored to conduct its affairs under the name of the College of Electronic Medicine.

How to Avoid Delays.

1. Address all correspondence to the College of Electronic Medicine.

2. Make all remittances to the College of Electronic Medicine.

3. Do not address any individual relative to official matters.

4. Make separate communications in all cases. That is, if you should send in a blood specimen for examination do not order parts or equipment in the same letter, since there is a possibility of overlooking your order. Whereas, if a separate communication accompanies the blood specimen, it can easily be removed and given to the party handling that department.

5. As a matter of policy the department head signs all correspondence in the name of the College, only, and not with intent to convey personal service.

Change of Address.

As announced in our last Journal, the College moved to its new location August 14th—and is now comfortably housed in **its own property.**

While the Postal Authorities have been notified we wish to impress upon you the necessity of using the new address—**1547 Jackson Street**—instead of the old address.

Addressing mail to individuals often causes a delay by being forwarded to the addressee who may have left our service. To be absolutely safe, address all correspondence to the College of Electronic Medicine, 1547 Jackson Street, San Francisco, California.

THANK YOU!

CROP INCREASED BY ELECTRICITY TAKEN FROM AIR.

BERLIN, Sept. 6.—(Special cable dispatch to Universal Service.)—Super-crops produced by electricity from the air are promised following tests of a new invention in Germany. The electricity is taken from the air by wires arranged like antennae, connected with a magnet, and conducted into the ground. The invention was tried on two adjoining fields, never fertilized. The field without the "electric massage" had a very poor crop, while the field with the electric treatment produced a super-crop.

LAST ISSUE

DO YOU KNOW?

Conducted by
L. BIGELMAN, M.D.
San Francisco, California

DO YOU KNOW—

That a German scientist claims the exposure of the soul by mechanical examination?

"SOUL EXPOSED BY X-RAY"

By Selfridge Hannagan.

London, August 28—Dr. Bissky, a German psychologist, is the inventor of this mechanism, which is termed an "inductorium," giving an electric current which, when applied to the skull of the subject, "faradises" the brain's reaction centers and so enables the operator to read various capacities for emotion and intellectual activity.

"There is nothing impossible in the claims put forward," a leading British scientist says:

"The brain is, of course, the physical mechanism through which the soul of man expresses itself, and measurement of the reactions of the brain centers, if it can be accomplished in this way, determines the nature of the man's soul and his capacities for good and evil.

"Immense possibilities are opened up by the instrument. Assuming that it is developed along rational scientific lines, and operators are trained in its use, the measurement of love and hate should be possible.

"For instance, assume that a young man declares himself in love with a girl, and there are modifying circumstances—the girl is wealthy, or some ulterior motive exists for his marrying her. With his machine it should be possible to determine just how far his protestations are genuine, and whether his real motive is real-love or self-interest.

"Another use would be in cases of jealousy, which is the cause of half the unhappiness in the world. A jealous wife, by the use of the machine, could ascertain the precise state of her husband's mind, and assure herself either that she has or has not cause for her suspicions."

"In order to test his machine to the fullest possible extent, its inventor, Dr. Bissky, has paid a series of visits to various German prisons, where, with the permission of the authorities, he has

applied his machine to the convicts in order to get records of their emotions and thoughts, and then compare the records with known data.

"At one of the prisons he was permitted to apply the machine to the prison staff. As a result, he declared that the machine revealed more pronounced criminal tendencies in the governor and warders of the jail than in the convicts under their charge.

"The method of using the machine consists in application to the skull of the subject, with a view to ascertaining the various reactions of the brain. According to German medical specialists, including Dr. Rahner, who witnessed the prison experiments made by Dr. Bissky, the machine is incapable of registering the finer emotions. Dr. Rahner gives it as his opinion that it is possible to reveal definite tendencies on the part of individuals.

"People more than normally fitted for the pursuit of such professions as music, sculpture, painting, etc., can be distinguished from ordinary intellects by means of the new machine in its present state, and already an institute at which 'probing the soul' is practiced, has been opened in Berlin.

"In medicine it will prove an immense aid to diagnosis, enabling the physician to judge by the brain reactions of physical defects and lesions. Malingering will become an impossibility while diseases can be recognized in half the time taken for diagnosis at present."

The reader will recall that Dr. Abrams stated the same things, and more, years ago, and demonstrated these phenomena by means of his Electronic Reactions.

* * * * *

That the moths communicate by radio?

"RADIO CALL BY MOTH REVEALED."

Stamford (Conn.), Aug. 8—(by Universal Service)—Whitman Bailey of New Canaan, entomologist, is convinced after a series of experiments with insects that they have their own radio set and communicate with one another. Bailey's observations, as he calls them, have extended through months and have included a variety of insects.

"I got the idea from a large female moth," said Bailey, "that had just come out of her silken cocoon. I placed her on a screen in my house and when I came back in less than an hour I found at least a dozen more moths of the male species congregated around her. They had come from the surrounding countryside.

"I then took the moth out of doors and placed her in an obscure part of the yard. In seven minutes these males began to arrive and presently fourteen were on hand. Then I took the female of the species back indoors and closed all the windows. In fifteen minutes a swarm of male admirers had found the new location and were knocking against the window panes. Others had joined the original group of admirers. I was convinced that radio communication had been going on among these moths.

"The next day was cloudy and no visitors came until the atmosphere cleared, and then they came in troops. The air waves would not penetrate through the thick atmosphere at first."

Does it require a great stretch of the imagination to assume that this "radio" communication exists between all things animate and inanimate, and is the basis of the ERA technique?

* * * * *

That the discovery of the Fountain of Ponce de Leon is the eternal pursuit of man?

"OLD AGE TO BE CONQUERED."

London, Aug. 28—Quietly, almost secretly, the most wonderful of all miracles is being performed by patient men in a hundred secluded laboratories—the miracle of the prolongation of human life.

Three-score years and ten! Thus, the ancient tradition of the human life-span runs. But it no longer holds good. Science has been too much for that period put to this earthly life. The human span is now nearer four-score years, and in the near future it may be a century and more.

The world seldom hears what is going on in the strange battlefields where scientists fight death.

Occasionally they hear of strange cases of rejuvenation by the Steinach gland operation or the Vornoff gland replacement process; of the discovery of the germ of this disease, and of a curative process for that disease; of the artificial creation of eyesight in low forms of animal life, of skin tissue brought to life after being taken from a dead body.

But few people outside doctors, scientists, and the men who do a large business in life insurance vividly realize the progress made to date in the struggle against all-conquering death. The insurance companies are well aware of the miracle. It means a great deal of money to them. They are working on out-of-date mortality tables. The new tables which are in preparation will astound the world when they are published.

Sir Ronald Ross, the famous scientist, gave us a glimpse of the truth when he revealed that in eighty years medical research has given us another twenty years of life. "That miraculous process will not stop," he commented. He was referring in particular to the increase in the average life of the London man.

Eighty years ago that man lived thirty-four years and seven months on the average. Today he has an average life of fifty-three years and nine months.

The pale, nervous, dark-eyed, electric Voronoff and the daring Viennese surgeon Steinach have nothing to do with this. Their feats are in the freaks of science. The credit is due to the progress of medical science in the treatment and prevention of disease.

"A famous American doctor," remarked Sir Ronald Ross, "has suggested to me that we should all be immortal. Who can tell what scientific investigation will bring? No one can say how long we may live when we are free from the ravages of germs."

It is bacilli which is responsible for almost all untimely snuffing out of human life. Scarcely anyone dies from senile decay. There is really no such fatal disease as "old age." No one knows why a man wears out. Scientists have yet to probe to its source the dark mystery of the disease of the cells which prevents them, after a certain period of years—varying with individuals—from renewing themselves.

If old age is due to abnormal processes which may be eliminated and if stimulation of certain functions will aid in deferring old age, then ERA furnishes a fertile field of experimentation and research in that direction. Perhaps some of our Colleagues have made observations in this field.

* * * * *

That there are other blood tests than ERA for sex and that the results are just as peculiar at times, yet apparently accepted? The following is an excerpt:

HENS BECOME ROOSTERS, BUT BLOOD STAYS FEMALE.

It is possible for a hen to become a rooster, and to be the father of chicks by another hen as mother; and yet his (or her) veins will still be filled with female blood. This paradoxical phenomenon has just been reported to "Nature" by F. A. E. Crow of the University of Edinburgh. He had seven hens, indubitable females that laid eggs and hatched them. He tested

their blood by means of a chemical color reaction devised by Dr. E. O. Manoilov, a Russian scientist, and it showed the female color, as was expected. Then for some unknown reason the hens all became males, took unto themselves harems of wives, and to all physiological intents and purposes were valid roosters. But when the chemical test was applied it showed that their blood was still female. It looks like a case of what was bred in the bone not coming out in the flesh.

* * * * *

That the adrenal gland secretion is supposed to be the cause of body heat? Dr. Charles E. de M. Sajous, professor of endicrinology at the University of Pennsylvania thinks that adrenin, the secretion of the adrenal glands, is the important factor in the production of body heat. He believes that adrenin is carried to the lungs, where it takes up oxygen and is then absorbed by the red corpuscles of the blood and transported to the tissue cells. Here these complex chemical compounds that originate in the glands react with the partially digested food products to produce heat. The heat action is further controlled by the secretion cholestrol, which prevents heat formation, while thyroxin from the thyroid gland acts as a stimulus to assure adequate heat production.

Dr. Sajous believes further that light and heat radiations increase the activity of enzymes in the tissue cells, thus enabling them to break down disease-causing germs and their toxins.

The question occurs to us, at this point—may not other radiations or forms of energy, such as that derived from the Oscilloclast do the same thing? Dr. Sajous' theory helps to explain certain phenomena which may be observed in patients under Oscilloclast treatment.

* * * * *

That the following discovery, if true, may explain the peculiar relationship between starchy foods and certain diseases?

About a year ago we published an article, in which we arrived at the conclusion that in certain of the arthritides, and in most streptococci conditions, it was wise to reduce the starch element in the daily diet. We based this on electronic determinations and clinical observations. The discovery of Prof. Mellanby seems to offer corroborative evidence. We believe that these "Toxamins" may be found in all grains and starches, as well as other classes of food. Further research will undoubtedly prove this.

"TOXAMINS," OPPOSITE OF VITAMINS, DISCOVERED IN OATMEAL AND BREAD.

"Vitamins, the group of beneficial though little-known substances found in certain foods, have a family of evil-doing opposites, according to Prof. Edward Mellanby, F. R. S., of Sheffield University. These malignant twins of the vitamins he has christened "toxamins," and he claims that they exist in greatest concentration in the foods that are used as the principle elements of diet by large sections of the white race. The most notable offenders in harboring his newly-discovered causes of ill-health, he says, are oatmeal and wheat. The principal effects of the presence of toxamin so far investigated are prevention of proper bone formation, and in some cases serious nervous disorders.

"The harmful effects of oatmeal and other cereals on the development of bone can be reduced if the cereals are allowed to germinate for some days and are then heated at boiling temperature for eighteen hours. Both germination and heat are necessary for this purpose, it is stated.

"The scientific reason for spreading butter on our bread is that apparently the harmful effect of the toxamins in cereals is counteracted by the fat-soluble vitamins, which are present in the butter.

"The troubles which vitamins act to prevent and cure have long been regarded as being due merely to a lack of the proper vitamins in the diet, so that these diseases, such as rickets and beri-beri, have come to be known by physiologists as 'deficiency diseases.' If Prof. Mellanby's claims are confirmed by later investigation, an entirely new aspect will be placed on this whole series of ailments, since their causes will be transferred from a merely negative category to a group of really positive evils. Many physiologists and physicians are still doubtful of the genuineness of the new discoveries, and the subject is one that is likely to be much controverted for a time."

* * * * *

That iron salt is recommended as a cure for poison ivy? This point is worth knowing because, although the condition is not a serious one, it is nevertheless a very annoying one, and one against which we have few effective weapons.

"IRON SALT RECOMMENDED AS CURE FOR POISON IVY."

"Poison ivy meets it match in the iron compound known as ferric chloride, according to a new booklet on the toxic weed by Dr. James B. McNair, which is being issued by the Field Museum of Natural History. Dr. McNair discovered in the course of exhaustive researches on the chemical nature of ivy poison that this substance is rendered insoluble and thus made harmless by chemical union with iron. A number of soluble iron salts, he says, are effective against poison ivy, but he has found ferric chloride to be most suitable. His treatment calls for a mixture of one part by weight of ferric chloride with ten of alcohol and ten of water, to be washed on the skin and allowed to dry there, before one goes into places where poison ivy grows, and also after such possible exposure. This, it is claimed, will entirely prevent the development of ivy poisoning in the great majority of cases."

LAST ISSUE

NOTICE—After October 1, 1926, this Journal will be consolidated with the A E R A Journal, making one Electronic monthly, for all Erators, as well as the official organ. Unexpired subscriptions will be completed by the A E R A JOURNAL.

"The motive of this Journal is to replace the cell doctrine by the Electron theory. Vital phenomena are dynamic and the actions of organisms should be regarded as processes and not structures. Exclusivism is excluded insomuch as all sciences are embraced in practical medicine and diagnosis must invoke physical, biological, and chemical methods. All problems in medicine not in accord with the progress made in physical science are doomed to perish." —Dr. Albert Abrams.

We invite and encourage articles on ERA, but do not necessarily hold ourselves responsible for the ideas contained therein.

Citation from other sources will be duly accredited.

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NOTICE—The College has moved to 1547 Jackson Street.