

The Osteopathic Physical Therapist

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The Osteopathic Physical Therapist

Vol. I

OCTOBER, 1930

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This publication is inspired by the humanitarian value of Physical Therapy in the alleviation of suffering and prevention of disease.



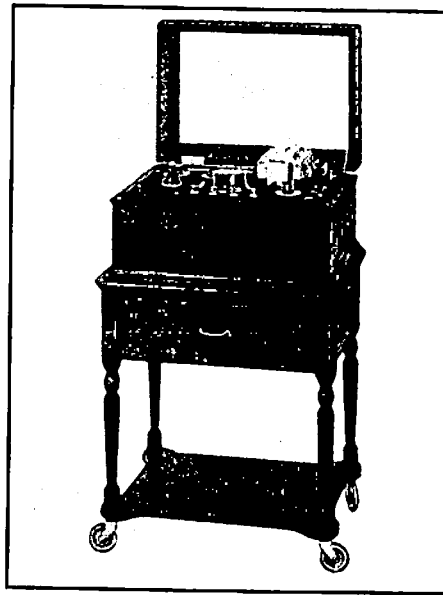
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Editorial and Business Office

807 EAST ALLEGHENY AVENUE, Philadelphia, Pa.

Telephone, Nebraska 1840

J. L. HANSON, D.O., M.D., *Editor*

EDW. H. FRITSCHE, *Business Manager*

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Greetings

This, the first issue of THE OSTEOPATHIC PHYSICAL THERAPEUTIST, marks the initial appearance of a journal devoted to the interests of the Osteopathic profession and to the newer and kindred science of Physical Therapy.

Of the need of such a publication there can be no doubt. For some time now, leaders in Osteopathy have recognized how closely allied are these two branches of the healing arts; have realized how appropriate it is that the Osteopath should be also the Physical Therapist.

Throughout Europe today, and increasingly in America, the medical profession is turning to Physical Therapy. This has not been an overnight development, for it was not easy for a profession which, by training and tradition, holds the administration of drugs to be the chief mission of the physician, to adopt a method of healing which uses *natural* methods. To accomplish this overturn in medical opinion, it has taken nothing less than revolution.

How much more logical is the easy transition of the practicing Osteopath into the practicing Physical Therapist, for the two are virtually synonymous. Like Osteopathy, Physical Therapy believes fundamentally that the well-being of the individual depends upon the maintenance of the structural integrity of the body mechanism. Like Osteopathy, Physical Therapy asserts that nearly

all disorders of the body are at first in a functional state, evidencing some interference with normal processes. Like Osteopathy, Physical Therapy believes and teaches that, if properly managed, these conditions can be definitely cured by *natural* restoration of the *natural* functions.

Nor do the methods of Osteopathy and of Physical Therapy basically differ. The Osteopath—or, rather, the Osteopath who is not also a Physical Therapist—restores the normal function by means of his ten fingers. The Physical Therapist—whether or not he be also an Osteopath—restores the normal function by means of efficient and tested modalities. With the exception of the correction of a bony lesion, there is nothing the modalities cannot do which the Osteopath can do with his ten fingers. And what is infinitely more important, the Osteopath who has these modalities at his disposal can perform a tremendously increased amount of work with far less effort than if he lacks these modalities.

From the earliest beginnings of civilization, man has set about devising means for obtaining the greatest possible results from the least possible expenditure of effort. From the time of the invention of the lever down to the present, he has done this by machines. In adopting the modalities of Physical Therapy, the Osteopath is doing nothing more than following this trend of all mankind.

Granted, then, that the Osteopath should be also the Physical Therapist, how is he to attain this end? This journal hopes to point the way. Not only will THE OSTEOPATHIC PHYSICAL THERAPEUTIST fulfill the functions of the official organ of those groups of the American Osteopathic Association which are interested in Physical Therapy, but it will perform a more personal service. Thus, all questions concerning Physical Therapy modalities and their use which Osteopaths wish answered will receive replies in the columns of this journal from the Council of Physical Therapy of the A. O. A. In addition, authors of papers published in THE OSTEOPATHIC PHYSICAL THERAPEUTIST will answer any questions concerning subjects herein treated upon. For example, Dr. J. L. Hanson, who has described in this issue how European "water cures" may be administered at home in America, has informed those responsible for this journal that he will answer any personal queries concerning this matter that may be addressed to him or to the Council.

THE OSTEOPATHIC PHYSICAL THERAPEUTIST welcomes all suggestions for the improvement of or addition to its contents, as well as papers upon Physical Therapy or related subjects by recognized Osteopaths and designed for publication.

To the Secretary,
 Physical Therapy Society
 of the American Osteopathic Society

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The Congress at Liege and Physical Therapy in Europe

By J. L. HANSON, D.O., M.D.

Fellow, the Fifth International Congress of Physical-Therapy

In Belgium there is a saying, dating back to the monks of medieval times, that purports to describe the spirit of the little nation's cities.

Brussels, it is said by these authorities, rejoices in its noblemen; Antwerp in its money, Ghent in its turbulence, Bruges in the beauty of its women, Louvain in its learning, and Malines in its fools.

In this provocative old saw there is no mention of Liege; perhaps it has remained for Liege to rejoice in being, at least for a time this September, the center of a relatively new therapy which today is definitely revolutionizing the practice of the healing arts.

Liege, as you know, was the location of the International Congress of Physical Therapy and an interesting as well as a fitting location it was.

In the valley of the Meuse, the city is intriguing enough in its own right as an old and prosperous manufacturing town, the seat of a great university where the Congress was held. Quaint costumes abound and dog-drawn carts are still seen, pulled by splendid Belgian animals that remind one of Ouida's famous "Dog of Flanders."

Added to these attractions are the city's eventful war-time experiences. It was at Liege that the German artillery first proved its efficiency against fixed forts and the town and surroundings suffered greatly.

It was in these surroundings that physicians from all parts of the world gathered to substantiate their success with physical therapy. Is it difficult to imagine how such a vast number of medical physicians have become so deeply interested in a newer school of the healing art? Is it difficult to conceive scores of great scientists turning to a therapy which stresses the freedom of the body, its joints and ligaments and tissues; freedom of the circulating fluids, blood and lymph?

It should not be difficult for the osteopathic physician to comprehend this revolution in heal-

ing. For every man at the Liege Congress emphasized the fact that any lack of freedom, curtailing or congesting the vital functions of the body, causes disease. And did not Dr. Andrew J. Still preach this long before the mechanism of physical therapy was known?

Probably this will be better understood when I quote in part the words of one of the leaders in the medical profession, a leader and exponent in physical therapy, a leader of men and in his heart, I believe, a sincere believer in osteopathy.

"That the general public," this man said, "has been for a long time passing judgment on the limitations in the practice of medicine and public indifference to the profession is very largely due to professional disregard of the use of methods that are neglected. That the public have confidence in methods that are not constituted a part in the practice of medicine is due to professional negligence. When a meeting can be held of six hundred prosperous osteopaths (referring to the National Convention in Philadelphia, July, 1930) who are serving the public because the medical profession has absolutely ignored principles in comparison with the medical methods, there must be a reason. Why does not the medical profession thoroughly investigate and adopt what is good instead of allowing the public to go elsewhere and engage the services of those who give them relief? There is today something radically wrong with medical teaching in failing to observe and employ methods that have proved practical. Until the medical profession, as a profession, recognizes physical therapy as it should be recognized, the public who are becoming more and more enlightened will keep away from those who ignore it and other organized bodies not recognized by the medical profession will thrive."

What better compliment could be paid our own profession, than this, especially coming from one who has been a worker and a leader in the field of medicine for more than 50 years?

But how many of our own osteopaths place

themselves in the same position as do many of the medical fraternity, believing that they can accomplish all that is required in the healing art with their ten fingers and without appropriate adjuncts.

Do not the osteopaths and the physical therapists believe fundamentally the same, that the well being of the individual depends upon the maintenance of the structural integrity of the body mechanism?

Osteopathy, for more than a half century, has fought its way up through the decades and has today reached a place in the scientific art of healing. It is receiving recognition by a vast army of individuals and more and more so-called regular physicians are accepting its value.

The Liege Congress was one of the most complete ever held. All diseases and ailments were discussed and in no way did drugs enter the subject. Clinics were offered, demonstrations of technic were of such a nature that the most fastidious could not refuse to accept the curative forms. It clearly demonstrated that natural methods in the care of the sick or as a prophylactic measure are the most effective. Drugs and surgery in the majority of instances were condemned.

It showed how a large percentage of surgery could be avoided, if more physical therapy were understood. It conclusively proved that manual and mechanical measures are far superior in the treatment of such diseases as influenza, pneumonia and cardio-renal diseases than drugs.

All physical modalities were equally given credit for their worth.

WHAT EUROPE IS DOING IN PHYSICAL THERAPY

When compared with the work in European centers, the present uses of physical therapy in this country seem to be a long way behind. This applies not so much in methods as in the number of cases handled in the various institutions as well as in clinics and private establishments throughout the continent.

To illustrate: At the London Clinic, specializing in light therapy, the number of treatments of out patients now is in excess of 100,000 a year. This center uses mainly the Finssen light, a carbon arc arrangement giving ultra-violet,

visible light and infra-red rays in one treatment.

St. Bartholomew's Hospital, also in London, uses the entire range of physical modalities and in the past year treated more than 300,000 patients in its clinics, giving mainly diathermy, galvanic, sinusoidal and X-ray treatments. One feature of European practice that should be considered more by the American physician is the use of galvanism, a modality which does not as yet seem to have reached its proper place in this country.

In Paris the St. Louis Hospital has an annual treatment roll of more than 700,000 treated by various modalities. Here again galvanism is featured, large sections being given over to this treatment with the wall plate modality mainly used.

Many lessons can be learned from the work at Dr. A. Rollier's clinics at Leysin, Switzerland. Here at an elevation of 4,500 feet in the Alps, heliotherapy is used. Here the statement is made and continually borne out that surgical tuberculosis in all forms, at whatever stage of development or at any age, responds to these treatments. On the theory that tuberculosis is not a local ailment but a general disease involving the whole organism, this organism is restored to vital energy by atmospheric and solar action. As stated by Dr. Montheumis, of Nice:

"To live and act always as if the organism were strengthened by means of digestive ailments only is to make a clean sweep of all recent discoveries and their application in therapeutics and hygiene. This imperfect and narrow-minded conception entirely warps our daily hygiene. Man does not feed on bread alone; he also feeds on the air, the bread of breathing; the alimentation is not only digestive and respiratory, it is also cutaneous."

While they no longer recommend the plaster cast, they remain determined supporters of all orthopedic methods which form the basis of treatment in tuberculosis of bones and joints. When the sun does not shine they resort, in certain cases, to radiotherapy and to phototherapy.

With the accumulation of cases due to the war, many facts are advanced. At Leysin, it has been observed among interned soldiers that, after a few weeks of heliotherapeutics, penetrating wounds that had been suppurating for eighteen

months and more, have dried up. The healing of indolent and recalcitrant sores, the disappearance of inflammatory residues and oedema, the development of muscles and the recovery of movement in articulations that had been until then ankylosed were also seen. These lessons are being practiced in the treatment of industrial injuries.

Heliotherapeutics have been found to be a favorable influence on infantile paralysis. Thanks to the treatment, muscles affected by this complaint have in many cases recovered a part of their mobility and contractility. The same applies to certain cases of "Little's disease."

In short, according to Dr. Rollier, the individual and social value of the sun-cure is invaluable; not only does it prolong lives that are threatened and doomed, but it gives back to society individuals able to earn their living and to fulfil their family and social duties. Quoting Michelet: "The human flower of all flowers is most in need of sun."

Combined with the treatments is the work cure or occupational therapy. Patients are trained and encouraged to carry on the making of woven novelties, furniture and a wide variety of articles.

THE MESSAGE OF LIEGE

Practically every phase of physical therapy use and modality were treated at this session of the Congress by those attending, American physicians present contributing no small part of the information as to improved technics and developments of treatment.

Based on the Congress and the general activity of European centers, special emphasis should be given to the uses of galvanism. This treatment generally is based on the electron theory. This theory, as you know, is that all bodies are composed of small particles called atoms, which are composed of still smaller particles called electrons and protons. Large amounts of energy are represented in the binding together of electrons and protons into atoms and smaller amounts of energy in the binding together of different atoms as molecules. Charging a body consists in distributing the equilibrium by taking away or adding a negative charge or electron. When a stream of electrons flow through any substance

there is an electrical current. A negative charge results from an excess of electrons; a positive from a deficiency. The uses of this current will be gone into at more detail in this and subsequent issues of our journal.

Turning to some of the points made by physicians at the Congress, a brief resume is presented of the various outstanding papers, some of which in their practical entirety will later be published.

It might be mentioned in passing that the use of the static currents, which of recent years seem to have fallen behind in physical modality use, is being advocated in a number of treatment forms.

REVIEW OF OUTSTANDING PAPERS

In his paper, "The Hepato-cardiac Syndrome," William Martin, M.D., of Atlantic City, N. J., concludes that, in his opinion, there are numerous patients who suffer from an unrecognized condition which in reality is a syndrome with a reversal of the generally recognized organic relationship. He believes that a sufficiently large number of typical cases prove that the liver may be a primary cause of heart pathology; that hepatic enlargement causes cardiac dilation as well as aortic dilation, instead of the generally accepted theory of the opposite relationship; that this offers a matter for further study and corroboration and its recognition is of great importance.

Diagnosis depends upon a carefully taken history, a laboratory and X-ray examination as well as a thorough physical one. When these findings are correlated, one will have a proper ground work for a correct diagnosis.

Treatment varies with the case but there is a general line of therapy which may be followed and deviations made as required.

It is the usual practice to start treatments with diathermy of the liver. The dose will vary with the case, but from 1,000 M.A. to 1500 M.A. is given for at least half an hour. Heart diathermy is used only in those cases which show definite myocardial weakness. When the heart is treated it is essential that the most careful technic be used. Each machine should have a switch within reach of the patient so that he may stop the treatment if the operator is unavoidably absent or busy. It instills confidence.

The next step is the wave current of the static machine. A long spark from six to ten inches is used, with the machine running slowly, to give deep contractions and relaxations. This treatment lasts about 20 minutes. These treatments are generally given daily until improvement warrants spacing them.

That asthma and other conditions successfully yield to physical methods was brought out by Frank Blish Carpenter, A.B., M.D., of New York City. He advocates an Oxyline Apparatus, in which a high frequency current forms ozone. The ozone passes through a tube containing soothing, healing oils, giving what is termed Oxyline. This, being of a gaseous nature, readily enters the nose, throat, and all the connecting sinuses and into the air cells of the lungs. By increasing the hemoglobine in the blood, it tends to build up the resistance of the body to disease and by its soothing, quieting effects on the nervous system it relieves insomnia so that, if combined with other physio-therapeutic agents, morphia and other habit-forming drugs need not be given.

"There is a rapidly growing distrust of the medical profession among the laity," says Dr. Carpenter, "of old surgical methods, as evinced by the increasing development and use of physiotherapy, and in the turning to fads, cults and isms by the laity. These fads, cults and isms they will drop as soon as we can show them that we have something better. Here and now is our great opportunity and responsibility. Will we rise to the occasion and do our full duty?"

"Our work will be mainly along the lines of preventative medicine first and physio-therapy second, or rather the simultaneous union of both. In the first there is little that is new in theory but much that is lacking in practice. In physio-therapy rapid progress is being made."

"Studies Concerning Dessication and Coagulation in the Treatment of Neoplastic and Allied Diseases," was the topic of Dr. William L. Clark, of Philadelphia. He said in part:

"The value of high frequency effects known as dessication and coagulation in the treatment of neoplastic and allied diseases has been amply demonstrated by numerous workers in the field. When lesions are treated by either of these methods, wounds heal by granulation and no

sutures are employed. The high frequency knife is likewise useful in surgery. When it is employed, sutures are used to close wounds, which heal by first intention.

"There is an impression among the profession that the dessication and coagulation methods are one and the same. This is an error, since the effects produced on the tissues are quite different and can be readily demonstrated, both clinically and histologically. The Oudin current, by which dessication is produced, is of relative high voltage and low amperage, whereas the d'Arsonval current, by which coagulation is produced, is of lower voltage and higher amperage.

"One who depends upon any single method can hope to attain but a limited degree of success. Experience has taught me that the cold scalpel, electrosurgical methods, radium and X-rays are all factors of such importance that none of them can be eliminated. I hold no brief for any particular method but experience has demonstrated to me the extreme importance of electro-surgical methods. I consider them second to none and in some emergencies superior to all others. The terms dessication and coagulation are employed because they describe the actual effects produced in the tissues.

"My conclusions are that dessication and coagulation, when employed with correct technic, are the most satisfactory methods designed for the treatment of localized neoplastic lesions of the skin and mucous membranes."

"Malignant growths in cavities such as the antrum, larynx, bladder, etc., may be made accessible by incising with the endotherm knife and then dessicated or coagulated as may be indicated," stated Dr. George Austin Wyeth, of New York City, in his treatise, 'The Evaluation of Electrosurgery in the Treatment of Cancer.'

"Schmieglow, of Copenhagen has reported exceptional results in the treatment of tumors of the larynx and Beer's success in the treatment of bladder tumors is well known. From Kelly, of Baltimore, have come interesting reports of the value of electrosurgery in abdominal conditions. Berven, of the Radiumhemmet, in Stockholm, is treating carcinoma of the vulva exclusively with endothermy; Holmgren, of the same institute, is handling his cases of carcinoma on

the antrum with endothermy alone or in combination with external radiation. Blumenthal, of the Charite Hospital in Berlin, is removing primary operable carcinoma of the breast by the cutting current with subsequent radiation. Sampson-Handley, of London, in a recent report, concludes: 'For the past year I have operated upon most of my cases of breast cancer by the electric needle instead of the knife. The method presents great and appealing advantages.'

"Thus is the weight of evidence increased and although at first the obvious benefits of treating malignant lesions by electrosurgery surprised and delighted both operator and patient, the experience of many years has shown us that results here, as elsewhere in this law-governed universe, move logically from cause to effect."

"Electro-biophysics; Electrotherapeutically Conceptive and Perceptive," was the subject of Joseph E. G. Waddington, M.D., C.M., of Detroit, Mich., a member of the American Medical Author's Association. He said, among other interesting things:

"The inertia of electromagnetic oscillations, of electrical currents, will necessarily overcome, increase or decrease the inertia—physiological or pathological—as relatively manifest in the tissues. The human body is a highly complex heterogeneity of electrons organized into atoms, molecules, cells, organs, and—the finished organism. Man, the vital moving force of which is electricity; a concentrated stream of free electrons in motion.

"In various modifications of electricity in therapeutic use, such as the galvanic or constant current; sinusoidal and high frequency currents, visible and invisible photo rays; Roentgen and Grenz rays, differ only in the concentration and velocity of these same electrons. Galvanic and direct currents are a massively but slow moving stream of electrons. Sinusoidal and faradic currents are rapidly interrupted modifications of the direct and alternating currents. High frequency and diathermy are extremely rapid, alternating currents of high pressure or voltage. Light moves with great velocity; radium radiates some waves (gamma) approaching the velocity of light and some less (beta rays); X-rays represent the greatest velocity obtained in mechanically produced electricity.

"Every molecular or atomic disturbance will of necessity cause a change in the essential characteristics of the electro-biological function of the cells thereby affected. Of electric and magnetic interaction or induction, we can only conclude that any electrical disturbance which actually reaches or passes through the living cell must cause in it at least some changes, no matter how obscure or minute."

Galvanism as a treatment susceptible to every necessary change for treatment was outlined by Dr. Emma Dawson Parsons, Waterloo, Iowa, in her paper on, "The Evolution of the Low Volt Constant Current — Galvanism — in Medical Practice with Report of Cases." She said:

"The galvanic current is of tremendous force for regeneration. It possesses chemical qualifications by way of its distinct polarity. No other form of electricity can come near it for many uses. Galvanism may be selected and manipulated just as are drugs, it can be used as a local or general stimulant, as an irritant to awaken an indolent part, and to excite motor-sensory or secretory tissue. We can disintegrate, we can lower activity or allay pain, we can bring about absorption of fibroid hypertrophy or the products of inflammation. This, though, requires wise technic, proper dosage in just the right way. A patient needs to be taken as a whole.

"After 43 years of all methods of cure, as they came along, I still wish galvanism for diseases of spine and brain and their membranes—anaemia, passive and active congestion, threatening apoplexia and post-apoplexia. Gynecology in all forms, most of all chronic diseases whatsoever, lacerations of the perineum and cervix, stenooses, mental disorders; for injuries it is invaluable.

"A good electro-therapeutist should be available in each locality. Now very few can reach one. When once we are established with other good parts of our profession, the people can again respect and trust their doctor; they do not now."

"Physical Therapy in a Distinctive Type of Cardiovascular Disparity" was treated by Dr. Mary L. H. Arnold Snow, of New York City.

"Splanchnic dilation or vascular relaxation of the splanchnic area present a symptom complex with associated physical and nervous phenomena," she said. "It is of greater frequency than

generally supposed and is one of the most serious pathological conditions encountered by the physician and unfortunately one which has been generally overlooked and consequently neglected. It probably occurs more frequently in women but men are not immune.

"The treatment is direct to the cause. Visceral drainage and toxic elimination are best treated by high colonic flushings, radiant light and heat, hydrotherapy, carbon arc baths, the static wave current or the wave generator or sinusoidal current in varying combinations."

The case for static electricity was interestingly handled by Dr. F. William Humphris, of London, in his paper. "The Indications for Static Electricity on Disease." He said: "If we turn for one moment to consider the physiological effects of static electricity, we shall perhaps understand why its sphere of usefulness covers so large an area. The main effect of all currents with the exception of the static breeze, derived from the static machine, is mechanical. They induce muscular cellular contraction and hence promote tissue drainage. In addition to this mechanical action the static breeze discharge and that derived from the high frequency vacuum electrode have a chemical action from which is derived the antiseptic properties of these currents.

"We find that among the effects of the static current they give:

In the Circulatory System,

- (a) Increased arterial tension,
- (b) Lessen heart frequency,
- (c) Lengthen diastole,
- (d) Increase pulse volume;

In the Respiratory System,

- (a) Relieve rapid and labored breathing,
- (b) Cause deeper breathing with an increased elimination of the carbon dioxide.

In the Nervous System,

- (a) Relieve irritability,
- (b) Induce soporific effect;

In the Vaso-motor System,

- (a) Induce diaphoresis,
- (b) Induce diuresis, with elimination of urea, and cause a general metabolism.

In the Muscular System,

- (a) Cause muscular contraction,
- (b) Tissue pulsation and
- (c) Tissue drainage.

Additional features of the static use were given by Dr. William Benham Snow, of New York City, to whom belongs the credit of having made the first scientific proofs of its clinical value. His subject was, "The Evaluation of Static Electricity in the Treatment of Rheumatism and Allied Conditions."

"The swelling—local stasis—occurring after all traumatic injuries of the joints and involving all structures at a site of inflammation from whatever cause, is the bete noire of both the surgeon and physician," he said.

"It has been the author's good fortune for many years to make intelligent use of static electricity, after discovering the properties of the static modalities for removing inflammatory exudations at the outset. The peculiar characteristics of the static current, the constant current of high voltage, is that as a constant current it possesses the properties of the constant current, the galvanic current of low voltage, and with the high voltage, low amperage induces independent muscular contractions of the structures beneath the skin deep into the tissues by the special modalities employed.

"The high voltage of the static modalities readily penetrates and stimulates the tissue beneath the skin, causing contraction of the mass of muscle cells, which then set in motion with successive contractions and release effectively express from the tissues any accumulation in the lymph spaces. It is on this principle that the properties of action of the static current effect the removal of inflammatory exudates.

"From long use of these modalities the writer and his associates and students have demonstrated beyond question or doubt that it is possible in cases of early stasis or swelling arising from trauma or other cause, as from focal infection, rheumatoid arthritis, and rheumatism, to remove the inflammatory exudation from the tissue when the cause is corrected and when treatment before hyperplasia has taken place. The dissipation of enlargement in various internal viscera of the body, as of the cirrhotic liver, the enlarged malarial spleen, or a swollen prostate gland, are likewise successfully disgorge by the intelligent use of the static modalities.

"It is a duty, with the knowledge and experi-

ence attained during thirty years of operation with many thousand cases successfully cured, to urge upon the fellows of the Congress a considerate investigation of the principles involved in a method of treatment with successful cures of so many conditions with attendant relief of disability, pain and suffering."

"Static electricity in our hands, has proven the most valuable modality we possess for the relief of non-infective inflammation. Through its use we have returned to their gainful occupation many injured employees who came to us totally disabled," stated Dr. Frank S. Meade, Madison, Wis., Medical Director of the Builders Mutual Casualty Co., in his paper on: "Static Electricity in Industrial Injuries."

He also outlined the peculiar characteristics and effects of the static currents and illustrated the technic used in certain injuries. Among these were low back injuries, calcified bursitis, the so-called "Charley Horse," severe bruises to the muscles on either side of the spine in scoliosis and spondylolisthesis, subastragoloid arthritis following a fractured os-calcis, torn plantaris, broken arches and sprains.

That physical therapy methods can rejuvenate the race, was the opinion of Dr. M. W. Kapp, of San Jose, Calif., in his paper, "Electrotherapy in Pelvic Diseases with Special Reference to the Use of Static Electricity."

"My aim in this article," he stated, "is to call special attention to the usefulness and the effectiveness of the static current in pelvic diseases. When we know more of issue and cell frequencies we will be better able to produce the reactions which we desire. When we can determine the frequency of cancer we will be able to restore the cancer cell to the normal.

"The real wealth of mankind lies in the energy that can be expressed through physical, mental and moral channels. Energy within the body comes from a normal functioning of all the organs of the body, plus the special creative and differentiating organs of sex. The desexing of men and women, that is now so common, will some day be looked upon as a dark page in the history of the practice of medicine. Physical therapy is teaching us constructive methods of dealing with life's energizing forces. Remember

removing an organ does not restore the functioning power of that organ."

He outlined what may be done in practically all forms of pelvic infection or disease.

"Sterility cases will respond most quickly to the static wave treatment," he said. "We are constantly demonstrating that the finest time of a woman's love and creative work comes after she has passed the menopause.

"Divorce courts would not be half as busy if there were more understanding physical therapists to direct the sex life and the pelvic health of men and women. Feeding of gland and hormone extracts would be less necessary if more physical therapy were intelligently used. Moral health and moral activities are the result or normal sex health. Immoral conditions are most often the results of abnormal sex conditions and sex hormone production. Many persons who get into prison because of lewd conduct could have been saved from it by proper instruction and physical therapy treatments rightly applied."

That the State of New Jersey is saving \$1000 per day in addition to large sums which are no longer needed for new buildings, by curing cases through physical therapy treatments, was brought out by Henry A. Cotton, M.D., Medical Director on the New Jersey State Hospital at Trenton, in his paper, "Gastro-Intestinal Stasis in the Psychoses."

"In eliminating sources of chronic infection in the teeth, tonsils, sinuses, gastro-intestinal tract, genito-urinary system, etc., it has been shown that the mental cases all harbor these infections and by eliminating these sources of chronic infection and eradicating the systemic toxic poisons produced by the same, the patients recovered," he said.

"As the result of this work the recovery rate has been doubled in the last ten years. As we have 2,000 patients who have recovered during this time, we are convinced that 1,000 of these were due to eliminating chronic sources of infection so that we can justly claim 1,000 patients are out of the hospital who would have remained there without the specific treatment. This means a saving of \$1,000 a day to the State in maintenance and also the State saves the cost of new buildings to house these patients.

"The use of X-rays to determine teeth conditions and other points of infection and also to check the changes of the gastro-intestinal tracts was advocated.

"It (physical therapy) is especially applicable to the treatment of intestinal stasis and has superseded operation in 80% of the cases which show intestinal stasis."

Dr. Frederick H. Morse, of Boston, presented "Septic Dissemination From the Cecum and Its Effects Treated by Physical Methods."

"It is a connected fact that local foci of infection outside of surgical, dental and puerperal areas are being recognized to a much greater extent than they were a decade ago. This medical advance has been and is doing much in allowing the physician to foresee threatened dysfunction.

"It has taken several years to recognize the important discovery that there is, in a majority of adults, a close relationship between colonic toxemia and infected tonsils.

"These different situations in dealing with the physical treatment of an infected cecum, are sufficient evidence that any rational treatment outlined must be persisted in until the colon is apparently in a condition of cleanliness and its musculature so rearranged whenever possible, barring fixed adhesions, age and conditions which antagonize the process whereby not only the ascending colon regions but the whole colon may be put in a position to resist future bacterial invasion."

Dr. Edward S. Smith, of Bridgeport, told interestingly of a case of myelitis and subsequent deformity. In the treatment static currents were used. Later a tension table was used. Then an oscillator. As the result of this treatment, the patient had recovered use of his limbs to a nearly normal degree.

Before I close this portion of this review I cannot refrain from mentioning that Dr. Catharine Gray Lynch, our American Osteopath of Paris, warmly received members of the Congress, assisting us to a great extent in visiting leading hospitals of France where physical therapy stands second to no other form of treatment.

BRINGING EUROPEAN MINERAL "WATER CURES" TO OUR FRONT DOOR

To turn from the Congress itself to other European activities, we cannot escape the revival of interest in hydriatics.

This is a sensible return to the remedial methods so highly practiced by physicians of the distant past, more particularly by Hippocrates, the accredited "father of medicine," whose work on "air, water and places," still lives.

Water is a potent and powerful remedy and more appropriate for the relief of suffering humanity, when scientifically administered than the profession seems to realize.

It is estimated that Americans visiting European Spas spend annually at least \$100,000,000, seeking health and recuperation. Should this not awaken the minds of our profession to the greater possibilities for therapeutics, which Nature compounds and offers to us?

Unfortunately, few of our osteopathic or medical colleges teach Hydriatics, and our physiological knowledge of mineral waters is in most instances very limited, but our most successful practitioners are always on the alert to keep in the vanguard, because osteopathy has always been closely related to any method of healing by natural means.

In the latter part of the Nineteenth Century, an old priest, Father Kneipp, was the most spectacular convert and teacher of water cures. His most famous "cure" was the late Emperor Franz Joseph, ruler of the old Austro-Hungarian Empire, who was given up to die from a severe attack of nephritis. Everything in Europe was summoned for him, but failed. The story goes that the old priest made the Emperor walk; he gave him what the Germans call the "blitz goos." The Emperor lived.

THE NEED OF TEACHING HYDRIATICS IN OUR COLLEGES

Every osteopathic school needs a chair to teach Hydriatics, to enable our graduates to know the physiological action and therapeutic properties of mineral waters and to have a grasp on their clinical indications.

The Water Laboratory, Bureau of Chemistry, of the Department of Agriculture, Washington, D. C., tells us that mineral waters are not curative agents, but are adjuvants to other forms of treatment.

Some of the most eminent medical authorities in this and other countries have tested the "curative" virtues of mineral waters and given their unqualified endorsement, attesting the therapeutic action of mineral waters as a remedial agent; however, let us pass by such detailed matters as whether or not mineral waters are curative agents and consider them as a valuable adjunct to our own osteopathic treatment.

ORIGIN OF MINERAL WATERS AND THEIR SOURCES OF MINERALIZATION

It is now an accepted fact that the waters of all springs, natural and otherwise, are meteoric in origin. Aristotle taught that there were large cavities in the bowels of the earth filled with air, and that this imprisoned air condensed into water which found its way to the earth's surface through fissures. Vitruvius was convinced that springs were due to the accumulation of rain and melted snow, which found its way into the subterranean reservoirs. Descartes propounded the theory that the sea was the source of the water which flowed into subterranean caverns, was vaporized and later condensed to water, and finally was forced upward through fissures in the rocky strata as springs.

THE PHYSICAL CHARACTERISTICS OF MINERAL WATERS

From potable waters, the physical characteristics of mineral water differ in many respects. Mineral waters are clear and transparent as a rule, but on the other hand, they may exhibit other tints of color due to mineral substances which they contain in solution in impalpable division. Frequently the whitish appearance observed in sulphur water is due to suspended sulphur; the yellow tinge is due to change of a monosulphide into a polysulphide. Again a pure white tint or shade may be due, and often is due, to the suspension of slate or clay in minute subdivision. The reddish tints are some ferruginous substance which is due to the suspension of the red oxide of iron.

The odor may be due to the soil through which the water flows, or the gases with which

it is charged, or to its mineralization, this being a physical characteristic of certain mineral waters. The taste is generally bitter, due to the predominating constituents. Alkaline water carries a particular taste, which is difficult to describe. Saline water possesses the characteristic of table salt. Ferruginous waters usually have a decided stiptic taste. Calcic waters are often slightly alkaline, more especially if they contain large quantities of calcium bicarbonate. The texture of mineral waters varies from harshness to smoothness.

BENEFICIAL RESULTS DERIVED FROM EUROPEAN HEALTH RESORTS

The beneficial results derived from the natural mineral waters at the various European Health Resorts have been known for centuries by physicians and a multitude of sufferers throughout the world.

Since the Roman Empire, every civilization has contributed its patronage and support to the health-giving properties of the old European Springs, representing the passage of rain water through the earth, where it dissolves and holds in solution some of the very substances that are health giving.

Besides the numerous medical authorities who have advocated the various mineral waters, there are the attestations of the great multitude of patients who have been benefited.

A so-called "cure" at one of the European watering places takes from three to five weeks, which equals the drinking of 30 to 50 bottles of water, depending on the individual condition and the nature of the disease.

The diseases treated cover almost the entire range of "chronics," and each spring usually specializes on certain types of ailments.

For example, Kissingen Spring owes its renown as a Spa principally to the Rakoczy Water, discovered in 1737, and issuing from the most important of its five springs. Its main action is to help promote stomach secretion and activity, has a sedative influence upon the nerves of the stomach and induces movements of the bowels. However, when taken in small doses evacuation does not take place, and even in chronic diarrhoea, excessive secretions and evacuations are checked.

Franzensbad, the spring which is recom-

mended for chronic sufferers of gastro-intestinal disorders, hepatic and portal congestion, plethora, and circulatory diseases, is for those requiring treatments extending over a long period of time. This water contains 3.65% Glaubers Salt, and acts chiefly as a purgative. Its sodium chloride contents stimulates, and its carbonic acid facilitates digestion. Unlike prescribed medication, the Franzensbad water does not withdraw water from the tissues, nor does it tax the mucous membranes and the kidneys as do vegetable laxatives.

Wildungen has been famous for years for its diuretic and solvent action in all diseases of the urinary organs. Its therapeutic action is most prominently indicated in so-called uric acid diathesis, gout, renal and urinary calculus and gravel; chronic nephritis, with and without albumin; pre- and post-operative treatment of operative procedures of the urinary tract.

Marienbad, one of the world's most famous health resorts, owes its reputation to the balneo-therapeutic value of the waters of the two strongly sulphated springs, the "Kreuz Brunnen" and the "Ferdianands Brunnen." Its indication is chiefly of constitutional and metabolic disorders.

Neuenahr, established decades ago the fame of "Rhineland," which is one of the most frequented health resorts of Europe. The two most important of the five Neuenahr Springs are the "Grosse Sprudel" and the "Willibrordud." They occupy the unique position of being the only thermal alkaline springs in Germany.

European health resorts are not only attended by patients from distant lands, but innumerable patrons from all stations of life have benefited by using this magnanimous and unstinting contribution of nature.

There are, however, a great number of patients, and it may be the majority of these, who, owing to circumstances, are not in a position to visit one of these health resorts. Now, however, many of the natural waters are bottled at the respective springs and medical authorities have proven that the natural ingredients, as well as the therapeutic value, remains the same for a number of years. The taking the "cure" at home will not interfere with the patient's daily vocation, and the sometimes necessary dietary regime

can easily accompany the use of the natural mineral waters.

TAKING THE CURE AT HOME

Patients should only do this under the direction of a physician, who thoroughly understands the pathology back of the patient's ailment, so as to intelligently regulate the qualifying effect of the water in accordance with each patient's requirement and susceptibility. The therapeutic efficiency of "drinking water cures" at home can be greatly multiplied when combined with the proper dietetic supervision, special attention to the general hygiene and well regulated exercise outlined in accordance with the requirements of the patient's physical condition.

For the past two years the writer has represented the German Spa physicians in Philadelphia, and has prescribed with excellent results the above-named mineral spring waters, with the exception of Neuenahr.

All water should be taken before meals. The water should not be gulped, but sipped slowly. In all cases, then increase gradually to six or seven glasses daily. In the same way reduce the daily quantity gradually towards the end of the course of treatment (between the fifth and sixth week). Patients having sensitive stomachs may drink a cup of coffee or tea at first, or add hot milk to the water. Neuenahr water may be taken with meals as a table water.

The outline of the home treatment is so arranged that it resembles that at the Spa. While European physicians have always appreciated the curative virtues of mineral waters, Americans have, through neglect, usually overlooked them. At the same time we have not given proper thought or attention to what we have in our own country, the duplicate of the best European springs. The administration, however, is a matter for individual choice, for although American waters are just as good, just as potent, just as efficient and are found in as great variety as in any country in the world, it is regrettable that their physiological and therapeutic properties, applicability and methods of administration have not been given more considerate attention by the American profession. Until this neglect is corrected we will have to depend on our "drinking water cures" at home being brought to us from Europe.



Above, King Edward VII and Party Taking the Water Cure at Marienbad



Above, the Vicinity of Neuenahr; at Left, Frauensbad

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DR. AUGUSTE ROLLIER

Founder of the International Factory Clinic,
Leysin, Switzerland.

Professor honoraire de l'Université de Lau-
sanne.

Membre d'honneur de la Société Beige
d'Etudes Scientifiques sur la Tuberculose, et de
la Société de Médecine de Suède.

Lauréat de l'Académie de Médecine de Paris.

Membre Correspondant de la Société de Méde-
cine et de la Société de Pédiatrie de Paris.

Corresponding Member of the Medical Society
of Scotland against Tuberculosis.

Fellow of the Royal Institute of Public Health
of London.

Member of the Clinical and Climatological
Association of America and of the International
Society of Surgery.

Ultra-Violet Rays in Normal and Pathological States

O. C. COLE, D.O.

Lewistown, Pa.

The use of ultra-violet rays is both old and new. Ever since the dawn of creation there were ultra-violet rays with their life-giving and health-giving properties. From the beginning of history we know that they were used to benefit man. The ancient Egyptians treated certain ailments by exposing their patients to the sun's rays; but only in recent years has man tried to get a pure sun bath by going into high altitudes above the smoke and dust of modern civilization.

This form of treatment was first used and perfected by Rollier, of Leysin, Switzerland, where in 1903 he established sanatoria at an altitude of 4,000 feet. Here patients were exposed nude to the sun's rays with unheard of results, curing many conditions considered incurable.

There is, however, a tendency in the profession, to refer to ultra-violet ray as sunlight therapy and to compare sunlight treatments with those obtained by the carbon arc or quartz ray. Sunlight is composed of all the visible and many of the invisible rays, the infra-red as well as the ultra-violet. The percentage of ultra-violet in sunlight is small and not at all constant. Then again, the ultra-violet rays that reach the earth through the dust and vapor-laden atmosphere are mostly of the longer or near ultra-violet. The near ultra-violet, together with the green, blue, indigo and violet of the visible spectrum are depressive and sedative in character, while the shorter waves are irritative and stimulative. In sunlight therapy we get all of these rays, many counteracting others so it is impossible to get a reaction as satisfactory as with the specific form of these rays. It is very much like a shotgun treatment where all of the spine is treated to be sure the proper adjustments are made.

The shorter ultra-violet rays from the sun cannot penetrate the particles of dust and smoke found in the lower regions of the air, hence in lower altitudes we must substitute the artificial source. Finsen, of Copenhagen, was the first

to attempt results by this means. He used the carbon arc, but his method of producing them was too expensive to make their use popular. He was also the first to claim that the blood in the capillaries absorbs most of these rays, hence their inability to penetrate into the tissues is not a handicap, for if we influence the blood stream, we can influence any and all tissues of the body. His cures of *Lupis Vulgaris* and kindred ailments were quite phenomenal for the time.

In recent years there has been rapid progress in the development of ultra-violet generating outfits. Different substances were mixed with the carbons of the arcs until it was found that the electrodes cored with tungsten, gave an exceedingly rich ultra-violet. The quantity was much improved but the quality remained about the same—the wave lengths of the rays given off from these arc lamps were all of the longer lengths.

As you no doubt all know, white light is composed of the seven colors of the spectrum, and each color is determined by the length of the wave of ether. These waves are measured in terms of Angstrom Units, one ten-millionth of a millimeter in length. Some physicians use the unit called Millimicron, one millionth of a millimeter. The most common unit, however, is the Angstrom Unit. The wave lengths of the visible spectrum measure 8,000 A. U. of the red, the longest to about 3,900 A. U. of the violet. Beyond this is the near ultra-violet to 3,000 A. U. Then comes the far ultra-violet to 2,000 A. U. Beyond this is the extreme ultra-violet of a more or less uncharted region until we come to the well-known X-ray and the recently discovered Cathodal or Cosmic Ray. The wave lengths of from 3,900 A. U. to 1,849 A. U., are the ones that concern us in this discussion, as we cannot get shorter ultra-violet from the burners in common use. They will not pass through any known substance, only a perfect vacuum.

The question naturally arises as to the process by which the ultra-violet ray affects the body. While it is not understood in all of its details, it is far from being entirely unknown. It is known that pure cholesterol, which is found in the skin and all tissues of the body, is activated by the rays. Some authorities claim that a substance associated with cholesterol, known as ergosterol, one part in a thousand by volume, is also influenced. It is claimed that this is even a parent substance of some of the Vitamins. This substance is dormant until exposed to the ultra-violet ray which brings about photo-chemical changes. This, or some derivative of it, controls the metabolism of calcium, phosphorus, iodine and iron. It also increases hemoglobin, hence oxygen carrying capacity. Ultra-violet radiation also increases glandular activities and oxidizes and destroys toxins. It is bactericidal and has analgesic effects.

When the quartz mercury arc appeared it was found to be a great improvement upon all generators yet developed. Quartz is used because it is transparent to all the ultra-violet rays from the longest to those of 1,849 A. U., whereas glass is opaque to all but the very longest of the ultra-violet. Then again, the melting point of quartz is almost twice as high in temperature as glass. Fluorspar is better than quartz as far as transparency to the short waves is concerned, but it is prohibitive in price because of the difficulty in working it. Almost all quartz generators are very efficient, so they are very acceptable.

It has been demonstrated that chemically produced ergosterol has no specific action. If this same ergosterol, however, is exposed to moderate quantities of ultra-violet radiation it produces most profound bio-chemical changes even in small dosage. One-tenth of a milligram daily fed to white rats with otherwise a rachitic diet produces greater changes in calcium metabolism in a few weeks than would be found at the end of a normal life circle. Definite calcification of the heart, blood vessels, degenerative changes in the kidneys, urinary tract, spleen, lymph glands, etc., are shown in two or three weeks. The normal dose for the cure of rickets in white rats is approximately one ten-thousandth of a milligram per rat daily.

The penetration of the ultra-violet into the

tissues formerly was supposed to be from six to eight inches. Plank even reproduced photographs attempting to prove that ultra-violet light penetrates a living body of 110 pounds. He failed, however, to include visible light from the equation and to take into account the possibility of secondary radiations sufficient to effect sensitive plates. This can be done by fluorescence and phosphorescence of the rapidly circulating blood immediately following exposure to intense ultra-violet radiation. Most authorities agree that the penetration of the rays is from one-tenth to one millimeter in depth.

The application of ultra-violet ray is followed by two reactions, local and general. The local is followed by symptoms of erythema in various degrees of severity, and the general by various changes in blood chemistry and other reactions, the total being beneficial in various morbid states. In speaking of erythema solarie, or sunburn, permit us to say that the reaction has no relation to that of X-ray burn. The serious condition of the later state has frightened many patients into a morbid fear of the reaction of ultra-violet light. The two are as different from each other in their general and local effects as the east is from the west. The heavy X-ray reactions are violently destructive, whereas the heavy ultra-violet reactions are constructive.

Dosage of ultra-violet rays is a very variable quantity. Age, sex, texture and color of the skin and endocrine type are very important factors. As a rule, young people are more sensitive than the older ones, especially the very young children. They should be watched carefully in the regulation of the time of exposure. Females are more sensitive than males. Blondes more than brunettes. In judging the blonde or brunette type, it is better to notice the color of the eyes rather than of the hair, blue eyes for blondes, and brown or black eyes for brunettes. In this way many exceptions to the rule may be avoided. A person may represent a brunette type and still possess a very delicate skin, sensitive to ultra-violet ray.

Then again the temperature of the skin is to be watched to avoid mistakes. A person possessing a very cold skin will not react as quickly as one with a warm skin. We have found it better, however, to give a very light exposure the first

time and to double the exposure each succeeding time until the tolerance of the individual has been determined, then continue to increase the dosage much more slowly until the maximum dose is reached. The operator should be careful to observe Lambert's Cosine Law which, as applied to ultra-violet radiations, is that it should be applied at right angles to get maximum efficiency, and any variation should be compensated by a longer exposure. The patient's eyes should be covered with goggles or cloth to prevent burning the lids, which are very sensitive to the rays, as is also the conjunctiva. They should also be told about a possible sunburn, as that will avoid fright on the part of the patient should it happen, thereby saving the physician considerable annoyance.

Contra-indications to ultra-violet light are rather difficult to find. Humphris, in his book, "Artificial Sunlight and Its Therapeutic Uses," has aptly described the situation in the chapter on Contra-indications. "This chapter," he says, "may appear to be brief, but it is difficult to make bricks without straw, and the contra-indications for treatment by ultra-violet radiation I have found to be few and far between." Among those conditions that are apt to cause trouble can be mentioned Sunstroke, Acute Pulmonary Tuberculosis, Pellagra, Diabetes, Menstruation, Pregnancy, Low Blood Pressure, Acute Pleural Pathology, Variola, the Pyrexias, Cardiac Disturbances, Gout and any other condition where a general acute infection is intercurrent. Some authorities state that Diabetes frequently responds unfavorably to the ray, some advise no ultra-violet radiation in menstruation, while others advise it if it is not influenced by serious pathology. Many authorities advise the ray in low blood pressure. The same can be said about pregnancy, in which case some advise it as a routine part of pre-natal care. Summing up the evidence then, it may be said that many cases that seem to contra-indicate ultra-violet therapy do not contra-indicate it at all, but require care in applying the treatment. The question of procedure simply resolves itself into proper technique.

Finally, we believe that the discovery of the uses of the ultra-violet rays in the treatment of disease and in the development of the human

body is the greatest step forward since Dr. A. T. Still gave his great science to the world, and that, combined with Osteopathy in the pre-natal care of children and during their growth to maturity, it is the secret in the development of the future race of Super Men.

Summary of Address given before the Physical Therapy Section, A. O. A. Convention, Philadelphia, 1930.

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Physical Therapy as an Aid to the Correction of the "Weak Foot"

WM. P. MASTERSON, D.O.

The weak foot is one in which the leverage action has been weakened or lost, with a consequent flaccidity or weakness of the muscles used in plantar flexion, so that the step has lost its elasticity and the individual walks "flat-footed."

To trace the cause of the weak foot, we must first understand the normal structure and function of the foot. The longitudinal arch of the foot may be divided into two parts, of which the outer division is formed by the os calcis, the cuboid and the two outer metatarsal bones. Of this arch, the highest point is at the articulation of the cuboid with the calcaneum. Although it is a permanent arch, the soft tissues are forced down beneath it when weight is borne, so that the outer border of the foot makes an imprint throughout its entire length, as contrasted with the inner and deeper arch formed by the os calcis, the astragalus, the navicular and the cuneiform with the three inner metatarsals. The outer or lower arch is the weight-bearing arch, while the inner or higher arch is more elastic and is used more in the leverage action of the foot.

The foot has two functions—it is used as a passive support and as a lever to raise and propel the body. When the foot is actively used it is, to a great degree, supported by the muscles, but when it is used as a passive support, the ligaments bear most of the strain. In active use the calf muscles supply the power and the metatarsals supply the fulcrum on which the weight is lifted. When the foot is used as a lever, its position in relation to the leg should be such that the line of weight passing downward through the knee and ankle joints is continued over the second toe. To accomplish this, the feet should be held practically parallel to one another. When serving as a passive support, the muscles are relaxed, the weight is transferred to the ligaments, the arches flatten somewhat and the feet are more or less abducted.

This is the normal action of the feet. However, the change of posture and the leverage action are not absolutely necessary for walking. That is to say, we can progress from place to

place even when the feet are held rigid in plaster casts or on stilts or even with wooden legs.

The weak foot is produced by the disuse of the leverage function and the persistence of the passive attitude of abduction during active use. This faulty abduction may be a habit, or may be caused by corns, bunions, or improper shoes, the three latter causes being due to the fact that their presence makes the use of leverage painful. The commonest cause of all is the improperly fitted shoe which compresses the foot making leverage an ordeal which the individual avoids and the arches of which actually interfere, through their rigidity, with the elasticity of the inner arch. Still another cause is any occupation in which the individual stands in the passive attitude for long periods, such as that of a cook, bartender or machine tender.

Disuse of function is usually followed by restriction of motion, particularly plantar flexion. The strain upon the muscles used in plantar flexion becomes disproportionate to their strength and the fatigue and strain of these muscles induces the symptoms of distress and pain in the feet and legs. The added work placed on the ligaments finally overstrains them and allows the bones of the arch to assume improper relations to one another, with a consequent increase of pain. The pain is usually referred to the dorsum of the foot, but may extend up the ankle and calf of the leg. After a time the patient will find that he is accommodating his habits to his feet. He rides where he formerly walked, he sits where he once stood and he no longer jumps off the street cars. He feels that his feet have lost their spring. Continued use increases the pain and discomfort and the patient is really a pitiable object.

The treatment of such a foot should be directed to the correction of the faulty posture, replacement of any misplaced arch bones, resumption of the leverage function and re-education of the disused plantar flexors. The patient should be instructed to obtain a pair of shoes which will permit of the proper leverage action. The best shoe for the purpose, in my experience, is the Foot Friend Shoe, designed by Dr. John

Martin Hiss, of Columbus, O. This shoe has a rigid arch built in the outer side and a flexible one on the inner side, thus permitting and encouraging the elasticity of the inner part of the arch of the foot. Any misplaced bones should be replaced and, again, I find that Dr. Hiss' technique, as described in his articles in the Journal of the American Osteopathic Association, is the most efficient and least painful for this purpose. In the early stages of the treatment, strapping to correct the undue pronation or dorsal flexion will prove useful. Adhesive plaster is anchored four inches above the outer side of the ankle, is extended under the internal malleolus, across the Tendo Achilles to about one inch below the external malleolus.

The office treatment, in addition to the replacement of the arch bones, consists of the use of two modalities to tone up the weakened muscles. 1. Diathermy, and 2. The Slow Sinusoidal Current. Diathermy is applied by having the patient place both feet on a piece of block tin molded to fit the soles and placing circular cuffs just below both knees connected to the high frequency machine by means of a bifurcated cord. From 250 to 400 milliamperes are used for twenty minutes. This is followed by the slow sinusoidal current, applied by placing the

patient's feet in a water bath with one electrode, the other pad being bound around the leg just below the knee. Sufficient current is used to produce general visible muscular contractions and is kept on for ten minutes. These two modalities are used three times a week.

The patient is also instructed to use the following exercises to further restore the function and tonicity of the muscles:

1. He is instructed to keep his toes straight forward or even slightly turned in while walking.
2. Outward rolling. With the weight on the feet the body is steadied by the support of a chair. The feet are rolled outward. Used twenty times a day.
3. The patient rises on toes and pulls in heels twenty times twice a day.
4. The short flexors are exercised by picking up small objects, such as marbles, with the toes.

The above treatment applied for a few weeks, with the co-operation of the patient, will in most cases completely restore the normal action of the foot.

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The Technic of the X-Ray

By FRANK A. ROWE, B.Sc., P.D.

X-ray Technician

Philadelphia, Pa.

During the past quarter of a century, the X-ray has so well developed and each year has come to be regarded with such increasing respect that from an interesting novelty it has now assumed unlimited proportions. The manner in which X-rays are generated is a very complex physical process, but fortunately for practical purposes a knowledge of only a few of the more simple laws governing the production of X-rays is necessary.

The X-ray tube commonly used in radiographic work at the present time is the radiator type which is a highly evacuated thin-walled glass bulb into which have been sealed two electrodes or terminals.

The target or anode consists of a small tungsten disk set in a solid bar of copper. This copper bar extends outside the tube and there supports a radiator consisting of a series of circular fins. Owing to the high heat capacity and conductivity of the copper bar and the cooling effect of the radiator the heat generated at the target is rapidly carried away.

The cathode of the tube is a spiral wire heated to incandescence by means of an outside source of electricity. When this wire or filament becomes incandescent it gives off cathode particles of electrons which are driven across to the anode or target by the high potential applied to the electrodes of the tube. When, however, the cathode particles or electrons strike the anode or target, X-rays are produced radiating from the spot struck.

X-rays are not particles of matter like the cathode rays, but a form of energy like light, and they obey all the laws of light, the difference being in the wave length of X-rays which is so short that it is far below the visible spectrum.

The electrical capacity of the tube is governed by the size of the focal spot on the anode or target. If the part to be X-rayed is heavy and considerable penetrating power and current are needed, the tube with a broad focal spot can supply it most easily, but for finer detail a

sharper focus tube should be used. It is very essential that you get to know your tube as no two tubes act the same.

The high voltage necessary for the generation of X-rays is obtained through the use of a transformer which consists of two insulated wire windings on an iron core. There is no electrical connection between these two coils which are called the primary and secondary.

The primary coil is connected to the alternating supply line of 110 or 220 Volts. The secondary coil which is excited by induction consists of a greater number of windings and the transformation is roughly proportional to the ratio of the number of turns in the two coils. For example, with a transformer with 10 turns on the primary coil and 10,000 turns on the secondary coil, an impressed voltage of 110 Volts on the primary side would induce 100,000 Volts on the secondary or 100 Kilo Volts. However, there would be a corresponding loss in the current value for if the amperage would be 10 amperes on the primary it would only be .010 amperes on the secondary or 10 M.A.

The modern method used to measure the voltage across the X-ray tube is the sphere gap which is much more reliable than the old point gap method. As a rule the sphere gap is not employed routinely for voltage measurement but is used to calibrate a volt meter connected across the primary coil of the X-ray transformer. Thereafter the volt meter is used as a guide for the kilo voltage setting and the sphere gap is used only occasionally to check the calibration.

If we are to produce satisfactory radiographs we must not only consider the quality or penetrating power of the X-rays (which is governed by the voltage), but must also take into consideration the quantity. The greater the temperature of the filament the more electrons will be emitted, hence the greater flow of current. This flow is governed by means of a resistance or choke coil in the low voltage line which heats

the filament so easy control of the tube current or milliamperage is obtained.

Therefore, through the governing of the voltage applied to the tube and the amount of the current flowing through it one is able to control the quantity and quality of the X-ray energy which it emits and consequently the quality of the radiograph. No more X-ray energy should be used than that which will just penetrate the heaviest part to be X-rayed.

It is assumed the X-rays travel in a straight line from the focal spot on the target through the object to the sensitized film. However, when an incident beam of X-rays strikes an object a considerable percentage of it is scattered in all directions by the atoms composing the object struck. The X-rays which are deflected from their path are photographically of the same type as the original X-rays and so cause a general haziness over the image formed on the sensitive film by the rays passing directly through. This scattered action is greatly reduced by the use of a Potter-Bucky diaphragm which is a moving grid composed of a series of alternating strips of lead and wood which are angulated so that each is placed in the radius of a 25-inch circle. The grid can be of two types, flat or curved, and is attached to a mechanism which keeps it moving while the exposure is being made between the patient and the film. The lead strips absorb the diverse rays which come from the tissues so the major portion of the image is formed by the primary rays from the focal spot on the tube. The movement of the grid is to eliminate the direct shadow of the lead strips so this takes a longer exposure and necessitates the use of intensifying screens.

These intensifying screens are composed of calcium tungstate and when exposed to the X-rays become fluorescent. By placing them in contact with a sensitive film they absorb the wasted X-rays and return the emitted ordinary light back to the emulsion to intensify the photographic result. It is important that an even contact be kept between the intensifying screen and the film surfaces or else the fluorescent light will spread and produce a blurred image. In actual use, intensifying screens are mounted in pairs in rigid holders called cassettes.

Up until within the last few years it was the

general idea that a dark room should be dark in fact as well as name. The modern dark room with its light, painted walls and equipped with the latest safe lights is indeed a pleasant place to work. In a few minutes after the eyes are accustomed to the room all objects become plainly visible and no feeling or fumbling is necessary.

If it is at all possible the processing tank and the loading bench should be on opposite sides of the dark room. On the film loading side there should be convenient arrangements for the developing hangers, cassettes, and a bin for the supply of films. A film transferring cabinet extending through the wall into the exposing room will be found a convenient accessory.

The main points to be stressed upon in the dark room are standard development, cleanliness and the proper care and handling of all films.

Using standard development which is developing at 65 degrees for five minutes in a comparatively fresh developer, a correctly exposed film should be of proper density and have satisfactory detail. Always be sure to stir the developer thoroughly and carefully; check the temperature before developing.

After development always rinse the film in the wash tank for about ten or fifteen seconds. This will greatly prolong the useful life of the fixing bath. Films should be agitated on first immersing in the fixing bath and once or twice during the fixation. They should be allowed to remain for about ten to fifteen minutes in the fixing bath before the final washing. This final washing should be made in clear running water for no less than fifteen minutes and then placed to dry in a clear, warm atmosphere where the air is constantly changing. Be sure no water is spattered upon a drying film as it will produce spots that are impossible to remove. Films should never be examined at length until they are thoroughly dry, as such handling is bound to mar the radiograph more or less.

If standard development is strictly adhered to and the radiograph is lacking in density under exposure is indicated. Too much density indicates over-exposure. In changing the time of exposure always allow about 50 per cent difference, as a slight change of about 10 or 15 per cent in the exposure time will produce no notice-

able change in the appearance of the resulting radiograph.

The developer should be changed at least every sixth week and at the same time always make it a rule to change the fixing bath.

In order to have uniformity of results we must have uniformity of technic. Slothful and slovenly methods of X-ray technic and failure to equip the mind with sufficient knowledge of radiography will only result in dissatisfaction. While the technic of exposure and development is quite simple it should never be employed in a slipshod method. Thickness of anatomical parts and their power of X-ray absorption must be seriously considered in the production of a successful radiograph.

There are also three terms with their definitions that all technicians should become familiar with. They are:

1. Radioparent: Applied to objects which offer no resistance to the passage of X-rays. Examples include skin, mucous membranes, pus, air, celluloid, cotton rolls, aluminum, and cardboard.

2. Radiolucent: Applied to objects which offer partial resistance to the passage of X-rays in varying degrees. Examples include dentin,

bone, pulp stones, calcium, bismuth, silicates and porcelain.

3. Radiopaque: Applied to objects of such molecular density that they are impervious to X-rays. The shadows they produce on the negative are very light. Examples include gold, steel, lead, platinum, etc.

PROCESSING PROCEDURE AND RADIOGRAPHIC TECHNIC

NOTE: The progress of radiology has been swift; its influence is being felt in every division of Osteopathy and the natural sciences.

For more than a year the Eastman School of Radiography has been successfully teaching exposure technic and correct processing methods to members of regularly scheduled classes, which are offered without cost or obligation. Radiologists, medical and osteopathic physicians and technicians alike have taken advantage of this unusual opportunity. Classes for the remainder of the year are November 10th to 15th, December 8th to 13th. If any osteopath is desirous of attending we are glad to take pleasure recommending from experience this course.

The subject and laboratory matter is so arranged that the inexperienced will derive a reasonable amount of benefit from this standardized course of study. The registration in each class is limited so that individual, practical and theoretical instructions can be given to each student. All that is required for you to attend is to write Eastman Kodak Co., Medical Division, 343 State Street, Rochester, N. Y.

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Osteomyelitis

By HERMON E. BECKWITH, B.A., D.O.

Los Angeles, Calif.

Professor of Radiology and Physio-Therapy in the Los Angeles College of Osteopathic Physicians and Surgeons

The favorable effect which the X-ray has shown on the various infections of bone disease is not a new phenomenon. Our attention was called to this fact by Stembo in 1899, who noticed that in the making of radiographs of a case of osteomyelitis that, "the pain had been greatly relieved, and the general and local condition of the patient was greatly improved almost immediately after."

Southard, in a paper before the Radiological Society of North America, which was printed in *Radiology*, July (1925), states: "From time immemorial tuberculosis of the bone has been considered and treated as a surgical condition, notwithstanding the fact that surgery in this disease has generally been unsatisfactory both to patient and surgeon. It is my belief that in the X-ray treatment of this disease a brighter day is dawning for the unfortunate individual who is suffering from bone tuberculosis. I began the treatment of bone tuberculosis with the X-ray more than five years ago. . . . Up to one year ago I had treated 27 cases, which form the basis of this paper, and preliminary report. Only cases in which treatment was completed one or more years ago are included, in order to give time for estimating results with respect to permanency." Southard goes on to describe the cases; some had been operated on several times; some had one or more discharging sinuses; "a large majority of these cases were of the worst type, cases of long standing." Of these cases he claims a cure in 81.13 per cent based upon a permanent result for one year or more. It might be well to note that of this number he claims a cure in 4 cases out of 5 of spinal tuberculosis, all of which were treated as ambulatory patients.

While on the subject of tubercular osteomyelitis we might also quote Philips, who writes, "Roentgen ray therapy is available as probably the greatest, but least used, therapeutic agent in the orthopedist's armamentarium. Night cries, muscle spasm, uncontrollable pain, temperature, and malaise frequently disappear after a few radiations. Chronic sinuses dry up and become obliterated."

Petersen and Hellman reviewed some 669 cases of so-called surgical tuberculosis and concluded that the X-ray can be used as an "adjuvant in the treatment of these conditions and that its use in small doses is imperative."

Wetterstrand gives an account of treating 234 cases, while Siedamgrotzky says that, "730 cases of surgical tuberculosis treated with the roentgen rays shows that this form of therapy is the method of choice."

When we named the topic of this article we had in mind more the type of cases classed as pyogenic in form instead of the tubercular. However, the tubercular type of bone infection is so common, and the results with X-ray and physiotherapy are so definite and so conclusive that we felt compelled to call attention to that side of the question.

What has been written and quoted regarding the tubercular form of bone disease holds good for the pyogenic form also. As far back as 1921, Philips wrote on the treatment of chronic osteomyelitis stating that, "sequestration is favored by X-radiation, the chronicity of osteomyelitis is markedly shortened and drainage by radiation of deep-seated abscesses is favored." Writing again four years afterwards Philips stated that his personal results simply "confirmed his original conclusions."

However, besides the X-ray we have two other equally powerful agents for good in the field of physio-therapy. They are the high frequency current used as diathermy, and the ultra-violet ray.

It is generally considered that any area of enclosed pus is a contra-indication for the use of diathermy. However, I am going to cite a case in which this rule or law was broken and with good results. Some time ago I had a case come to me—an Osteopath—who had developed a severe infection of the right thumb. When I saw the case, the end phalanx had practically all suppurred away, the middle phalanx was about half gone, and it was protruding out of a large gaping wound where a surgeon had made an incision to drain out the pus. It was a

genuine—simply rotten mess. Three surgeons had advised amputation of the entire thumb, warning him of dire consequences should he not do the same. We explained to him our hopes, our program and what we hoped to accomplish. As a result of the treatment of this case, using the three electrical modalities spoken of above, we succeeded in clearing out the infection, in time the wound closed and he was left with a fairly usable stump of a thumb.

While we were thus working on this case, he developed a severe infection of the opposite humerus, about mid way the shaft. X-ray showed considerable necrosis of the bone, about a third of the way into the shaft. The reason this infection had progressed so far and no attention had been paid to it before, was the patient's own fault as he kept it entirely to himself.

We felt that an incision should be made, the bone scraped and then we were willing to go right after it as we had the thumb. However, he was not thus persuaded. Surgical consultants had all advised the humerus being scraped. Accepting the responsibility, himself, we proceeded to treat as above. This infection was entirely conquered and the bone filled in normally and he was cured without surgical interference. In spite of this case, we would still urge that these cases should be scraped and drainage established. Once this is done, we are of the firm belief that the three electrical modalities will get results that no other therapeutic procedure can even hope to begin to compare with.

Sampson, writing on some complications of wounds, says, "If bone injury or osteomyelitis complicates, then, drainage being established, use sedative diathermia and local and general ultra-violet light to damp out the process. We have seen many exceedingly bad cases of osteomyelitis which had resisted repeated operations, months of irrigations, etc., clear up in a comparatively short time when placed upon this treatment."

Another case report along this line of work might be of considerable interest as well as to demonstrate the effectiveness of physio-therapy. Last September, we were called on to visit a case of chronic osteomyelitis in a young man about 20 years of age. We found a terrible looking scarred leg. This young man had been on crutches for over 15 years. He had his leg

cut and the femur scraped just 12 times. He had spent a considerable amount of time on the bed. When we were called he was being lined up for the 13th operation. His white blood count was a little over 12,000. He was running a temperature, and suffering from considerable pain. We started our treatments, he was given the X-ray weekly, and received diathermia and ultra-violet ray from a quartz mercury vapor lamp three times weekly from a nearby Osteopath.

The second week, his white count went to 14,000. A small incision was made and the pus allowed to drain out. It only drained for four days. At Christmas time, just about 3½ months after we started our line of therapy, he was told to throw away his crutches; a pretty good Christmas present to a young fellow who had lived on them for 15 years and more.

We expect to have this young fellow take diathermy for a year or more. It is the one thing that will help to bring those tissues back to a somewhat near healthy state.

We believe that we have cited both cases and authoritative references enough to establish in any fair mind the untold advantages of the use of physio-therapy in cases of osteomyelitis. To bring up more would be only unnecessary repetition. He who would not consider the help and the usefulness of physio-therapy in the light of the above references and facts can only be judged as one who does not consider his patient's good, but his own pocket and prejudice.

"DAY" OF INSTRUCTION AT SYRACUSE

Featuring the Annual Meeting of the New York State Osteopathic Society at the Onondaga Hotel, Syracuse, N. Y., will be a time of seeking and giving instruction in physical therapy.

It is the wish of the Physical Therapy Society of the American Osteopathic Association, of Dr. J. L. Hanson, who will conduct the course, and of his associates, Dr. Edward H. Fritsche and Dr. George W. Maxfield, to extend help to the many who are less experienced in understanding and applying physical forces in conquering disease. They are anxious that all should know what they learned through long hours of study.

A particularly attractive feature of the course is expected to be less theory and more practical instruction. "Round Table" discussions will be conducted for those whose hearts are in osteopathy and physical therapy to meet in real intercourse and discussion of these common interests.

Such will be the "Class—for Instruction" to which members of the New York State Osteopathic Society are invited.

As this session will be the first of a series of similar lectures and clinics to be held upon request under the auspices of the Society, it is our hope that all in attendance will derive the benefits looked forward to receiving.

JOHN N. HINES,

Secretary of the Physical Therapy Society of the A. O. A.

PRACTICAL HINTS

This department is being conducted by the Council of Physical Therapy of the American Osteopathic Association from the editorial offices of the *OSTEOPATHIC PHYSICAL THERAPEUTIST*, 807 East Allegheny Avenue, Philadelphia Pa. To avoid all unnecessary delays, all hints, questions and answers should be addressed there. Correspondence on any phase of these problems is invited.

QUESTION—I am writing to ask if you are willing to give me your opinion regarding a small cabinet, the "Quatremode." What books do you recommend to a physician who is entirely unfamiliar with any of the physical therapy apparatus? It seems quite as necessary to learn when the various modalities are contra-indicated as when indicated. The value of the sinusoidal current in certain disorders over the ultra violet, when and how and how often and how long to apply each modality.

D. O., North Carolina.

*ANSWER—*The apparatus to which you refer is of a type similar to several on the market. It is really a preliminary outfit as the diathermy current is limited for minor treatments. The high frequency Oudin current is good and the diagnostic and cautery currents prove popular. For complete medical diathermy, irrespective of whether or not you plan surgical work, a more powerful machine is necessary.

A wealth of information on the subject of physical therapy is obtainable from recent books. Waddington, Massey, Coddle, Hollander, Grover, Sampson, Morse, Snow, Eberhart, Granger and others are respectively recommended for your purpose.

QUESTION—Having practiced for twenty years without osteopathic adjuncts I at last became interested in them as a means to lighten my labors, otherwise I must soon give up a great

amount of my practice. I am considering some form of diathermy, colonic irrigation, and wish also to know your decision on the electronic machine as now perfected. Please advise me.

D. O., State of Texas.

*ANSWER—*There are a number of good diathermy machines distributed by reliable manufacturers. Unfortunately when you ask for "some form" of a diathermy it is hard for us to recommend, because we believe that before anyone should attempt to use diathermy they should be at least familiar with its basic laws and have in view a definite pathological condition to be treated. If you are interested in performing the so-called medical or constructive diathermy the modality should be so constructed as to give you an oscillating current of not less than 750,000 per second. If you are interested in surgical or destructive diathermy it would then depend on the sort of practice planned. Regarding your colonic irrigation aids. Shellberg is the oldest and specially built to meet the requirements in one's office. The Valkenburg is also proving its value. Less expensive ones and equally of value are the DeBerri and the Honsicker, or you can construct your own at less cost. Plans will be gladly sent you upon request.

You ask for our decision on the electronic machine as now perfected? We regret that we cannot supply this information because we have not satisfied ourselves of the scientific value supposedly attached to any of these so-called electronic machines. We are daily experimenting with two of them and hope at a later date to report our findings.

QUESTION—Please advise me regarding Mountain Sun (Loeb), Chicago.

I am looking for a lamp for both ultra-violet and infra-red. I have been considerably confused with the different agents and literature and have therefore refrained from buying.

Any information you can give me will be greatly appreciated on any form of electrical appliance.

D. O., New York State.

ANSWER—So far the manufacturers of Mountain Sun (Loeb) have not submitted details for the consideration of the Council, and until then we must refrain from advice concerning it until we receive desired information which we expect to secure very shortly.

Regarding a lamp for both ultra-violet and infra-red. The type most commonly used for this purpose is one of the forms of carbon arc lamp. These vary somewhat depending on the size and kind of carbons and the amperage at which they operate. Generally speaking, use of this type of light takes somewhat longer to secure the same amount of ultra-violet as secured from a mercury quartz generator. The carbon arc, however, generates ultra-violet, although not to quite the short wave lengths of the mer-

cury quartz, and at the same time visible light and infra-red.

QUESTION—I have a Meyer Cabinet and I have been unable to devise a means to use platinum loop cauterly for granular erosion of the cervix. Will it be necessary to get an additional coil with which to use platinum loop therapy?

D. O., Idaho.

ANSWER—These cabinets are offered in several forms and we do not have a catalog showing the number you mention. However, if it does have a cauterly circuit it should be plainly marked. If not, outfits for cauterly and operation of diagnostic lights can be secured for a comparatively small outlay.

In treating the cervical disorders mentioned, diathermy is being used to a considerable extent as an improvement and substitute for cauterly.

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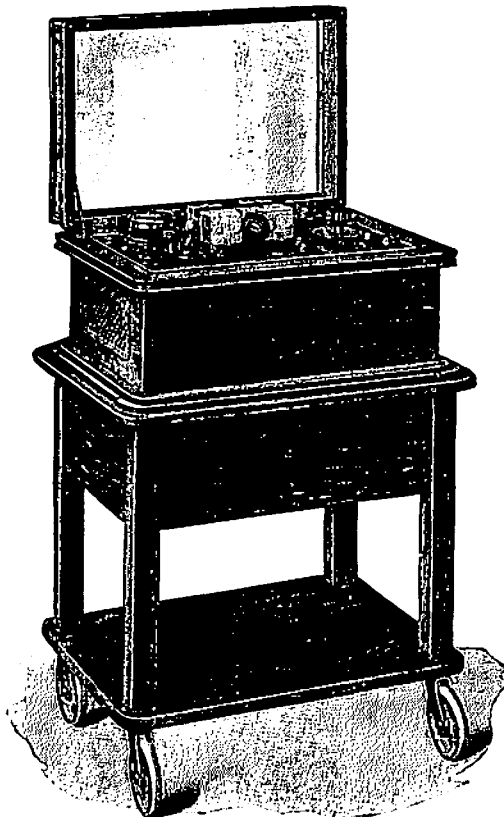
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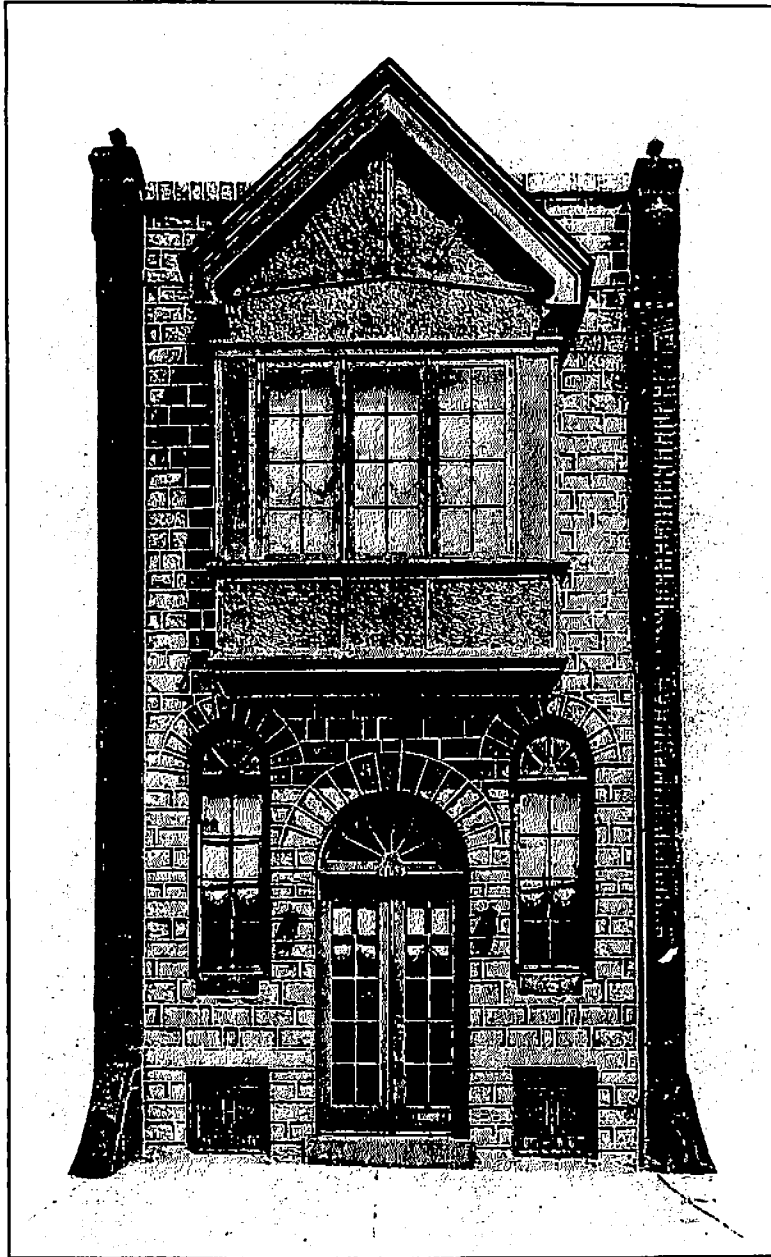
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