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A REVIEW OF RESEARCH*

I

INTRODUCTION

FREDERICK A. LONG

Director of Research

On April 1, 1933, a Department of Osteopathic Research was established at the Philadelphia College of Osteopathy. The general purpose of its work has been to conduct experiments and investigations in the general and special fields of osteopathy, and in such other fields as might yield information of value in advancing the science and art of osteopathy. It is the purpose of this series of articles to present a record of the work of this department during the first ten years of its operation.

There is a special significance to the time of publication of this work, for not only does it mark ten years of organized research at the Philadelphia College of Osteopathy, but it also coincides with the completion of a half-century of osteopathic education in general. This would seem to be a natural vantage point from which to examine the past and contemplate the future. There is probably none of us who does not wonder where we are going as a school of the healing art and where we will be in another fifty years. More particularly, we would like to know in whose hands our destiny is to lie. If we would have it in our own hands, there are some things that demand our serious attention.

The transitions through which the affairs of all men constantly pass are sufficiently pointed with us at the moment to suggest that one age in osteopathy is ending and another beginning. To some, who have not sensed the meaning of events as they have been gathering during the last half-century, the view of a changing era in osteopathy is a bewildering spectacle. They at the same time resent it and are fearful of it. We are told that much of "osteopathy" has been lost and replaced by something entirely foreign to it. Those who fear for us attribute the loss to many things—the lack of faith, laziness, the sinister motives of those entering the practice, the machinations of the older school of medicine, the pressure of supersalesmanship, and a host of other factors. We are exhorted to return to the golden age of osteopathy and the faith that was in it. We cannot go forward by going backward. If we would exert any positive effort in determining our own destiny, there is no starting point for us now except the present. Challenging realities which are inextricably bound with our future progress are all about us, and they are inescapable. What we do about these things now will determine the pattern of osteopathy for the future. Forward progress must rest upon acceptance of the fact that

*Ed. Note: This is the first of a series of papers presenting a résumé of the work of the Department of Osteopathic Research from 1932 to 1942.
we are part of general medical evolution, otherwise we will soon be left by the wayside of onrushing events. Our plans for the future must include clearer definition of philosophy, of purpose, and of policy than has obtained in the past. This definition will have to be produced out of the inheritance, the faith, the intolerance, the reluctance, and the realities of the age which is closing. Through objective analysis of these bequests to us, we at least can hope for the understanding needed to shape our own destiny.

We have an inheritance for which it is hard to find the equal in all medical history. It includes a concept of the nature of disease supported by those leaders of medical thought in all ages who had the vision to see beyond the rigid orthodoxy of their day. Elaborating upon this with his own mechanical ideas and principles Still sketched the basic structure of his system. He insisted that the body contains substances, mechanisms, and functions necessary to the reaction to harmful influences, that structural and mechanical disturbances can play an important part in impeding successful operation of these reacting capacities, and that manipulation can aid in restoring physiological balance. The new school was a revolution against medical practice of the nineteenth century. It was a manipulative and drugless school, and the early osteopathic physicians were manipulative specialists. From this beginning, the hard struggle for recognition and for the growth of our educational efforts began. It is a tribute to our early pioneers that in so short a time they were able to accomplish so much in spite of strong opposition. This is our inheritance and our contribution to the healing art. That we have used the inheritance wisely at all times during the last fifty years cannot be conceded so readily as that the heritage is a substantial thing upon which to build a school of healing.

Faith in the new system as delineated by the founder was to be the mark of the true disciple of osteopathy. It is unfortunate that the early faith did not remain one in the science of osteopathy rather than becoming one in the gospel of osteopathy. The many reasons for the various phases through which osteopathic education and practice have passed are known to all of us. But, we cannot hope to engender faith in our principles and practice until we become realistic enough and courageous enough to create from what we are and what we do today a sound philosophy and policy out of which a solid faith in us will be born as a natural consequence. We might do well to talk less of faith itself and think more of creating the scientific substance in which faith can be intrinsic.

Reluctance to openly approve useful practices which have originated outside of our school, but which have become generally accepted as part of osteopathic practice, has been one of the products of the age of our religious faith in osteopathy. We have insisted that osteopathy is the new order in therapeutics, and we have condemned the hesitation evidenced by the older school in accepting it as such. Yet, we are guilty of the same reaction to many of the valuable contributions made by the older school
of practice. We cannot sit back in our own corner and suppose that what is going on around us in the realms of science, including that of medicine, has little to do with our own future. It is evident today that medical philosophy of the older school is recognizing the patient and his inherent reacting mechanisms to a greater extent than probably at any time since Hippocrates, and to that extent it approaches osteopathic philosophy. Medical practice now even includes some manipulation. Osteopathy is broadening as its principles find application in wider fields. Osteopathic practice today includes the use of some drugs, and to that extent is consistent with certain practices of the older school. There are increasingly broad fronts where the two schools find themselves on common ground. So long as the fixed objectives of both schools is to turn out physicians equipped to treat disease by every useful method, overlapping on the scientific front cannot be prevented.

In looking toward the future, our first decision must be whether to continue according to a purposeful evolutionary pattern, bringing newly acquired experiences into line with our already established basic concepts, or to stop, become reactionary, and die. A fact that we seem to overlook is that the direction our development takes is determined by the resultant of both internal and external forces. Never having been the dominant school of medicine, we have been swept along in the current of medical evolution and have had to be content with driving the best bargain possible at the moment with external events. It is to the everlasting credit of those who have guided our ship on these waters in the past that we have been able to come as far as we have, more particularly in view of certain deficiencies in our internal scientific development. Even granting the measure of success this kind of impromptu policy has had in the past, it will not do for the future. The perils and pioneering of osteopathy are not past; our major struggles are not behind us. The battles of the future will be on two fronts, the external and the internal, and the internal will be the more important to us. We can believe, if we like, that osteopathy constitutes the final fulfillment of all medical aspiration and progress, and that the tides of future ages will unavailingly beat against the solid rock we have established. The basic truths upon which the principles of osteopathy have been founded are a solid enough rock, but the application of these principles in the light of constantly unfolding discoveries and advancements must recognize the fact of change—the only constant thing in life. It must be our burden to correlate the sound contributions of the osteopathic school with the moving panorama of medical evolution. This is our imperious inner necessity, and research is the principal implement through which it will be satisfied.

What is osteopathic research, and where should it be done? An osteopathic research program can be designed to prove the existence and importance of the spinal lesion and call it a day, or it may be based upon survey of the practice of osteopathy as it exists with a view to clarifying clinical problems in the light of a structural and mechanical concept. We
may well ask whether the osteopathic spinal lesion is the only factor to be
given serious consideration in osteopathic research. There are manipulative
procedures used in addition to those applied specifically for correction of
lesions which are consistent with our concepts and are an integral part of
our therapeutics. These things, too, must receive serious attention.

The basis for our therapeutics was established by Still. His were,
in the main, broad principles—sufficiently broad to sustain the growth
of the system they inaugurated. There was evolved as an important part
of those principles the concept of the spinal lesion. This concept right-
fully remains a dominant one around which much of our therapeutic effort
operates, and it is one of the important contributions of the osteopathic
school. Early osteopathic research logically concerned itself with a study
of the spinal lesion, and some valuable contributions concerning it were
made. The lesion theory is today one of the differentiating criteria be-
tween our school and the older school of medicine. There are, however,
many other things in osteopathy ripe for investigation. Shall we, in view
of this possible diversification of material for study, go before the world
with the proposition that the proof of all osteopathic philosophy and prac-
tice rests alone upon proof of the effects of spinal lesion? Such a
unilateral concept of things can never resolve all of the problems of
osteopathic practice. It would seem to hold promise of greater fruitful-
ness to have our research based not only on study of the lesion, important
as that might prove to be, but upon all phases of manipulation, and upon
study of the relationship between all tried and proved methods of treat-
ment which have become incorporated in osteopathic practice with what
we are pleased to call “our therapeutics.”

The teaching institutions of osteopathy—colleges and hospitals—are
the places best qualified to carry on research programs comprehensive
enough in scope to fill our present great needs. Certain isolated studies
which might be contributory to osteopathic research could be carried on
by outside agencies, but the major part of the work, the correlation of all
findings, and their interpretation in the light of practice—the thing which
gives research its life and the right to exist—can be done to the best
advantage of osteopathy’s scientific development in the teaching institu-
tions. It is in the colleges and hospitals where purposeful planning of
research to serve practical needs can be evolved. The idea of research for
truth’s sake alone must be tempered with recognition of practical require-
ments. Have we been so engrossed in proving a philosophy that we have
failed to see the actual scope of that philosophy as it touches the many
sides of practice? Have we lost sight of the fact that the philosophy must
constantly be correlated with the expanding fields of its application?
Where better than in the teaching institutions can these expanding fields
be adequately appraised in the light of the whole picture of osteopathy
and its many facets. It is the ever present practical problems arising in
institutional life that keep research in vital and productive channels. These
vital things in osteopathic research must be slowly developed from within,
they cannot suddenly be acquired from without. The money to expand and the endowment to insure continued operation will be attracted by sound programs actually in operation in the places where they are most likely to have the opportunity to continue productiveness. These places are the teaching institutions of osteopathy.

The Philadelphia College of Osteopathy established a separate Department of Research on April 1, 1932. The newly established department was an outgrowth of the Department of Principles of Osteopathy, and the Head of the Department of Principles was appointed Director of Research. From the first it has been the purpose of this department to conduct experiments and investigations in the general and special fields of osteopathy, and in such other fields as might yield information of value in advancing the science and art of osteopathy.

**Development**

With limitations in space, equipment, personnel, and money, it was necessary to devise some method of getting under way which would utilize to best advantage what was available. The evident lack of original investigations in the various college departments suggested one means of solving, at least temporarily, the personnel, space, and equipment problem. In collaboration with the various department heads, studies were worked out which could be carried on in the individual departments by their assistants and fellows, and cleared through the department of research. This method has proved satisfactory, and it has stimulated research endeavor in many departments. In addition to this work, experiments were begun in the research department itself. At the outset these activities were greatly limited in scope; but as additional space, equipment, and help became available, they were expanded.

Originally, the research department was quartered in one small room with such equipment to work with as could be borrowed from other departments. Expansion of space and equipment has been steady, and today the department includes five rooms, with a total floor space of 1000 square feet, devoted exclusively to osteopathic research.

**Organization**

The personnel problem is not the least difficult in developing a department. During the past ten years there have been several workers in the department who have contributed much to its development but who, for one reason or another have not remained in it. Much help was given in the early years by Morton A. Seidenfeld, B.S., M.A., and Henry George, III, D.O. Later, Martha M. Bailey, D.O., Philip M. Lessig, A.B., B.S., D.O., and William Tannenbaum, D.O., became associated with the Department. At present the department personnel are Frederick A. Long, D.O., M.Sc. (in Osteopathy), Director, Guy S. Deming, A.B., D.O., Associate in Research, and Viola C. Kruener, B.S., D.O., Assistant in Research. In addition to the members of the research staff itself,
Fellows in various other departments of the College and Hospital are at present working on research problems in collaboration with the Research Department, and to that extent constitute research personnel.

**Financing**

According to accountants' reports, as filed with Dean Edgar O. Holden, approximately $60,000.00 has been expended for original investigative work since 1932. Part of this money has been realized through the Annual Giving Fund and gifts from the Alumni and other friends of the College, specifically designated for research. During the academic year 1941-42, approximately $10,000.00 was allocated to the Department of Osteopathic Research for its purposes. This does not include a $400.00 Fellowship established through the Joseph V. Horn Foundation, or $200.00 given by the Research Committee of the A.O.A. Notable additions were made during the past year in the form of x-ray and laboratory equipment.

The need for substantial research endowment is vital. The figures stated above spread over a ten year period represent but a fraction of what must go into our research financing if we can ever hope to maintain the standards set for us by the exacting world of science.

**Program**

The program of work of the department has been considered under several general series, and the use of both human and animal subjects is included.

**Series I. Study of Case Records.** Case records from the hospital and the various clinics contain much information of value in analyzing osteopathic management in various disorders. Of particular importance is the incidence of certain spinal changes in specific diseases. Osteopathic spinal examination is made and the results recorded on the osteogram before the examiner has any knowledge of the nature of the case. These requirements we believe to be indispensable if data on segmental findings in various disorders are to be considered reliable. Spinal findings in a series of "normal" (non-clinical) subjects are used as frames of reference. Case analysis of patients treated in the hospital for various disorders constitutes a method for investigating results under osteopathic management and can form a background for consideration of comparative therapeutics.

**Series II. The effects of various physical factors, including osteopathic manipulation, upon certain measurable physiological processes in both "normal" and clinical subjects.** It is the general purpose of the experiments carried on in this series to furnish information of use to the osteopathic physician in the same manner that studies in pharmacodynamics produce data useful to the physician using drugs in treatment. There are many distinct manipulative procedures used either singly or in combination by the osteopathic physician. To be used most effectively in a given instance some knowledge of the separate effects of each manipulation should be available. The studies in this series have been broken down in two
ways: First, according to the type of manipulation, and second, according to particular functions which are capable of exact measurement. Sudden spinal joint mobilization in the different spinal areas and in the entire spine, deep pressure, active soft tissue manipulation, combinations of these, traction, etc., comprise some of the individual manipulations studied. Some of the functions which lend themselves to the type of measurement which is useful for the general purpose of the series are blood pressure, pulse rate, vascular status, secretory activity, cytologic processes, blood chemistry, basal metabolism, etc. Knowledge concerning the effects of distinct types of manipulation on each of these processes should precede any attempt to evaluate the place of the thing generally called "osteopathic treatment."

**Series III. Study of posture and body mechanics.** Of all the schools of the healing art which should know and have investigated the subject of posture and body mechanics, the osteopathic should rank first. It is doubtful if we can claim any dominance in this field on the basis of what we have produced. It can be granted that we were probably the first to suggest certain things which are receiving wide recognition today, but simply saying that a thing is so and writing it into the literature on authoritative evidence are two entirely different things. The field is almost limitless and the surface hasn’t been scratched.

**Series IV. Roentgen study of normal and abnormal vertebral mechanics.** The x-ray is one of the best means available to us in studying vertebral mechanics under both "normal" and abnormal conditions. Data available from such study will contribute to a better understanding of the spinal lesion.

**Series V. Study of certain diseases treated by controlled manipulative procedures.** In the management of many cases, various therapeutic agents are employed, and this often makes it difficult if not impossible to evaluate properly the place manipulation itself occupies in the ultimate outcome. It is the general purpose of the studies in this series to select patients for observation of the effects of manipulative treatment alone under such conditions of control as are seldom possible in the general clinic or hospital. Exact control of manipulations used and laboratory confirmation of observed clinical results are indispensable to acceptable statement regarding them.

**Series VI. Study of the osteopathic spinal lesion.** Placing this series sixth in our program does not indicate that this is, in our minds, its position of relative importance. Our series numbering coincides with the order in which studies were initiated. Much of the study on lesions involves animal experimentation. Not being equipped at the moment to house and care for laboratory animals in a manner necessary for satisfactory completion of work demanded by this series, such work must await the time when these facilities become available to us. The spinal lesion hypothesis of etiology is one which must command the greatest possible
attention, for this is one of the principal ideas which differentiates us from other schools. This is not the place to outline all the classes of studies and experiments which ultimately will go into the investigation of the lesion hypothesis. Our major problems in this regard would appear to be the following: More definite statement concerning the nature of the spinal lesion, establishing its place in etiology, and study of the mechanisms through which the lesion operates and through which osteopathic manipulation tends to restore stable states.

Series O. Miscellaneous studies in the various related sciences. This series includes all those studies which might not constitute an integral part of the immediate program as outlined under the above series, but which might contribute useful information which ultimately will find good correlation with the so-called "osteopathic" phases of the program.

This series of papers will present a résumé of the work completed under certain of these series.
The concept of health and disease developed in a previous paper and the principles flowing from it furnish a background for all rational therapy. Since health and disease cannot be defined except circularly in terms which themselves cannot be defined except circularly, we must start with a set of assumptions—of undefined terms treated as postulates. The postulates of health and disease chosen agree with the observed events in the empirical world as far as they are known at present. They express the relationship between the human organism as a physiological unit and the known world, and satisfy the requirements of adequacy and survival value for the organism. In the statement "rational therapy," rational means agreeing with observed events empirically determined.

In all living protoplasm, observed events are reactions to stimuli; and according to the postulates adopted, the adequacy—survival value—of the reactions accounts for the state of health or disease of the reacting organism. Since we are dealing with the relationship between the organism and the world in which it lives both must be taken under consideration and analysis in trying to reach an understanding of the events connected with the adequacy or inadequacy of the responses made by the organism.

From the moment of conception to the moment of death every living organism is played upon by a constellation of forces which vary in quality, in magnitude, and in quantity. These forces elicit reactions on the part of the organism which are adaptive changes whose kind and adequacy influence the state of health or disease of the organism. The weather is such a force because abrupt changes in temperature and barometric pressure demand compensating adjustment in metabolic rate. Infections stimulate the formation of antibodies. Infestations may have to be met by an increase in blood formation. Traumatic incidents which tend to produce shock are countered by vasomotor changes. Economic conditions may preclude the possibility of adequate diet. Personality impacts may lead to recognized psychosomatic syndromes. All these and unnumbered other forces—some of which are favorable and some adverse—affect the relative constancy of the internal environment which is essential to a "free and independent life."

The pattern of the reactions of the organism to a given stimulus
or group of stimuli depends upon the characteristics of the reacting organism. This in turn is determined by the inherent constitutional potential of the organism as modified by environment up to the moment the stimulus is received. Stated in different terms, the pattern of the observed reactions is the resultant of two sets of forces—the impinging stimuli and the dynamic reacting capacity of the organism. The foregoing discussion is general but points the way to the consideration of human therapeutics in which the proposition may be stated thus: A given patient’s clinical reaction pattern to stimuli depends upon the fact that each individual is endowed genetically with certain attributes which together make up a unique whole subsequently conditioned by his environment. Consideration of one set of forces while slighting or neglecting the other is incomplete and necessarily falls short of providing the practically possible basis for rational therapeutic procedure.

While the unique wholeness of each organism, each patient, is in fact indivisible in reacting to stimuli, yet in the practical appraisal of the total functional reaction, the reaction of parts must be examined. The reaction of such component parts as the heart, the kidneys, or the psyche, must be observed and evaluated, and the study of relationship between parts, and between the whole and its environment must be made with the awareness that many unknowable factors have necessarily been left out of the most thorough possible consideration. The diagnosis which leads to the selection of that therapeutic plan with the highest probability of clinical success will be that one which evaluates all observable, knowable factors within and without the patient. Factors of personality, physique, age, the functional level of organs and organ systems including the neuro-humoral system, the economic status, and environmental conditions surrounding the patient in and out of working hours must be sought out and appraised. For this purpose the history, the physical examination, and the various diagnostic tests which are available and judged appropriate are all employed. The point stressed here is the necessity for awareness that the most complete diagnostic procedure practically possible cannot reveal all the relationships, that usually the observations are near the surface of the problem, that much must be inferred, and the inferences checked during the course of treatment.

Further development of this thought recognizes that disease considered as the loss to some degree by a patient of appropriate reactions to adverse stimuli requires for the institution of a sound therapeutic plan evaluation of the relation between the kind, quantity, and intensity of the observable, knowable adverse forces and the quality and amount of the resistance of the body as a whole to the adverse stimuli. The patient’s resistance in turn is determined by the functional level of the mechanisms involved in the reactions which are connected with the symptoms. Keeping in mind the relationship between pathogenic stimuli and the reactions of the patient to them, the complex may be resolved into parts which can be investigated and evaluated on the basis of experiential knowledge. Investigation of
the environment requires search for important adverse stimuli. Investigation of the functional level of the mechanisms involved in the reactions of the patient requires more than consideration of the changes in the organ obviously displaying the pathologic symptoms—it includes an effort to ascertain why the organ response is pathological. It may be so because of constitutional inadequacy, because antecedent irreversible structural changes made it unable to cope with the existing conditions, because of the presence of pathogenic organisms, or because of other direct current or recent insult, or it may be because aberrant stimuli initiated elsewhere in the body are reflected in the organ complained of.

From this it follows that a rational therapeutic plan will include temporary or permanent change of the environment if that is possible and will cancel out harmful, or enhance or introduce favorable environmental factors which will aid recovery by establishing a relationship between the environmental forces and the resistance level of the patient which will accrue to his advantage. Such a procedure is exemplified when a patient with early active tuberculosis is removed from an unfavorable home environment and placed in a sanatorium where complete rest is possible. A rational therapeutic plan will include modification of function within the patient, if this is possible, as by increasing the contractile power of the patient's heart when decompensation is not extreme, and so restore his ability to cope with his customary environment. In brief it will consider the possibilities and methods available of reinforcing deficient function, of checking excessive function, or of removing interference with adequate function. If, however, neither alteration of environment nor of function is possible, or possible to a limited degree only, a rational therapeutic plan may have to introduce limitation in the patient's mode of life as a means of establishing a relationship between, for example, the demands upon the patient with extreme cardiac decompensation and such a patient's capacity to react which will contribute to survival value.

The inherent defense reactions of the body are mediated by its homeostatic mechanisms. These neuro-humoral mechanisms by which bodily changes are effected in response to stimuli are the same whether under any given circumstances the reactions are beneficial or harmful. It is observed that the integrity of these mechanisms may be compromised or overwhelmed by harmful agencies acting outside the body, or which have gained access into the body, or which consist in reversible or irreversible changes of the body structure. And it is observed that the resulting protective reactions may be either inadequate or excessive. From this it follows that the central principle of rational therapy is to bring the patient and his environment into harmonious interrelationship so that his reactions to stimuli shall fall within the physiological range which observation has shown constitutes homeostasis—health.

In putting such a rational therapeutic plan into operation the methods available to the physician for altering function are broadly physical, pharmacological, and psychiatric. Since this paper is a discussion of back-
ground and principles, not of methods or techniques of therapy, it will be sufficient to remark that there are as many function modifiers as there are body functions, that the behavior of the patient is inseparable from visceral function, that all visceral function involves the homeostatic mechanisms at some level of the integration characteristic of adequate body-as-a-whole function; and to stress that a rational therapeutic plan will employ those methods which experience verified by rigorous tests indicates are most likely to establish and maintain optimal relationship between the patient—brought to the highest possible functional level—and the world in which he must live. In making a choice of method or methods the physician whose only loyalty is to the well being of his patient will lay out his plan of therapy in the light of that loyalty. He will be pragmatic. He will know that there is no single therapeutic method of universal application and will employ all rational methods indicated which take into account the needs of the patient and the limitations imposed by the situation. He will not be interested to effect a cure by any particular method—but to effect a cure. The principles of the choice are plain. Making the choice of a rational therapeutic plan requires familiarity with methods and wisdom in their application.
INTRATHORACIC ADENOMA INVOLVING THE LEFT LOBE OF THE THYROID GLAND

REPORT OF A CASE*

PAUL T. LLOYD
Professor of Radiology

and

KENNETH L. WHEELER
Assistant Professor of Radiology

The following case is presented because of the radiological features, and because it offers an opportunity to call to attention the difficulties not infrequently encountered in the diagnosis and differentiation of diseases involving the mediastinum.

Case Report

The patient, male, age 45, and of Jewish extraction, was admitted to the Hospital by Dr. Clarence Baldwin on May 25, 1943, complaining of dyspnea, dysphagia, emesis, and substernal pain.

The history elicited the fact that the present complaint was of two years duration and that he had received diagnostic attention in a hospital in another city, where he also received roentgen ray therapy for a mediastinal tumor. Following the irradiation, the patient developed chest pain and vertigo. The chest pain extended to the neck and shoulders and upon entering our hospital was increasing in severity and becoming continuous. In February, 1943, the patient, while under the care of another physician, was examined by Dr. Ralph Fischer, who made a diagnosis of mediastinal neoplasm and recommended hospitalization and further investigation.

The family history revealed that the patient's father died at the age of 32, cause not stated. His mother, living at 77 years of age, had high blood pressure. A sister died at childbirth at the age of 25 years. Three brothers were living. One was reported as having peptic ulcer and another as suffering from diabetes. Four or five years previously the patient suffered an attack of renal colic, with subsequent passage of a calculus. He had been afflicted with frequent attacks of "sore throat."

Prior to the onset of the complaint, the patient used tobacco. He had not, however, smoked for the two years previous to his admission. He indulged in beer and wine occasionally. His sleep had been undisturbed.

His appetite had not been good for six months, and he reported a weight loss of 45 pounds during that time. His weight was 175 pounds. He experienced frequent vomiting, usually after the evening meal.

Vertigo was present, particularly upon exertion and he fatigued easily.

*From the Department of Radiology, Osteopathic Hospital of Philadelphia.
He was also dyspneic and complained of continual chest pain. There was no history of palpitation or ankle edema.

There was no urgency, dysuria, or hematuria. He had had calculus four or five years previous to admission. There had been no further attacks of colic, and recent urine analyses had been negative.

Physical examination revealed that the skin was dry and presented evidence of psoriasis. Examination of the ears, eyes, nose, and mouth was negative except for pyorrhea. There appeared to be some slight fullness to the throat in the region of the thyroid gland, and small cervical nodes were palpable but not tender or fixed.

The chest appeared symmetrical and showed normal expansion. The heart sounds were regular and of good quality, though somewhat faint. Heart enlargement was not established. The lung fields were clear and resonant.

The blood pressure was 108/80, the temperature 98° F., the pulse 76, and the respirations 20.

Examination of the abdomen was negative, and the reflexes were found to be normal.

Urine analysis showed an alkaline reaction, specific gravity of 1.011, and was negative for albumin, sugar, and blood. It was positive for phosphates.

The blood count showed hemoglobin of 71.83 per cent (11 gm.), coagulation time of 5 minutes, 4,200,000 erythrocytes, and 7500 leucocytes. There were 41 per cent lymphocytes, and 59 per cent polymorphonuclear neutrophiles.

Wassermann and Kahn reactions were negative.

Blood sedimentation rate was 19 mm. at the end of 1 hour. It showed a diagonal line with slight terminal curve.

Roentgen ray examination of the chest was made on May 25, 1943. At screening there was noted increased width to the superior mediastinum, chiefly to the left side. The trachea was deviated to the right. At administration of barium the esophagus was found to be displaced to the right with no impediment to the passage of the liquid medium. Deglutition produced no shift or change in position or size of the mediastinal enlargement. The heart and aorta were not enlarged, myocardial action was of a fair quality, and no aneurysm could be demonstrated.

Film examination, including kymography, revealed evidence to support the presence of a tumor mass located to the anterior half of the superior mediastinum, reaching maximum width at the sternoclavicular level and extending upward to the base of the neck. The trachea was displaced to the right side from the level of the seventh cervical vertebra above to the level of the fifth dorsal vertebra below. At the latter site the tracheal bifurcation was to the right side. The right side of the tumor mass was smoothly limited by the trachea, while on the left the border of the tumor was irregular due to multiple calcified masses located within its limits. The
No. 1. *Frontal film*—showing the tumor opacity and dextral displacement of the trachea.
No. 2. *Lateral film*—showing the tumor in relation to the aorta, the location of the lowermost calcified opacities and the posterior displacement of the trachea.
No. 3. *Bucky film*—showing the character and location of the calcified foci.
No. 4. *Kymographic film*—establishing absence of pulsations in the tumor. Note the cardiac contraction and aortic pulsations and again the overlapping of tumor opacity to the aortic arch.
No. 5. Post-operative film—mediastinal widening but scarcely noticeable. Absence of tumor and calcified opacities demonstrated, with the trachea in mid-line.
tumor opacity appeared to merge with the aorta. Kymography revealed no pulsations in the tumor and myocardial activity did not appear altered. (Figures 1, 2, 3, 4.)

The findings noted referable to the mediastinum suggested the following diagnostic probabilities: (1) aberrant thyroid, assuming intra-thoracic proportions with calcifications taking place in adenomatous foci, (2) tuberculoma or inflammatory tumor mass with regional nodal calcification.

The basal metabolic rate on May 28, 1943, was minus 33 per cent.

The patient left the hospital on May 29, 1943. Due to further exaggeration of symptoms he returned to the hospital June 10, 1943, being admitted to the surgical service of Dr. Carlton Street.

On June 26, operation was performed under ether anesthesia administered per bronchoscope. The surgical approach was made through a wide, low collar incision. The left lobe of the thyroid gland was exposed and was found to extend dependently beneath the sternum for a distance of about 8.0 cm. The tumor was fixed to surrounding structures, and dissection was difficult. The tumor was freed, brought to the surface, and the pedicle ligated and cut. The left thyroid vessels were ligated. The incision was closed with drains inserted at the upper and lower limits of the wound.

The patient was returned to his room in good condition. His convalescence was satisfactory and uneventful, and he was discharged from the hospital on July 21, 1943. (Figure 5.)

The following is the tissue report made on July 7, 1943, by Dr. Dressler. "The thyroid gland submitted measured 13 x 7.5 x 5.5 cm. and weighed 250 grams. The lower pole was represented by a cystic mass which we would judge to have been in the mediastinum. This cystic mass was ruptured and showed considerable necrotic debris within. The walls were irregularly calcified with irregular calcified trabeculae running through the mass.

"Sections of the cystic portion of the mass described above show it to be perverted and modified thyroid tissue. The colloid vesicles are small in size, somewhat irregular, however, and widely separated by interstitial substance. The latter is somewhat homogeneous, densely fibrous and hyalinized after the fashion seen in a fetal adenoma. Because of the great amount of hyalinization of the supporting framework there has been an excess of invasion by calcareous debris. The latter makes study of the tissue quite difficult and of some portions impossible.

"It is our impression that it represents a fetal adenoma of the thyroid assuming a mediastinal position. We doubt that there is any neoplastic disease present."

Discussion

The diagnosis of mediastinal tumors is not infrequently difficult. Tumors found to involve the mediastinum include malignant tumors of
the thymus, carcinoma of the esophagus, lymphosarcoma, Hodgkin's disease, lymphatic leukemia, dermoid cysts, ganglioneuromas, and neurofibromas. In addition to neoplasms, other mediastinal lesions are encountered at radiological investigation of the chest which assume importance from the standpoint of diagnosis and differentiation. Among these are aortic aneurysm, aortitis, aneurysm of the brachiocephalic vessels, substernal thyroid, esophageal diverticulum, cardiospasm, tracheobronchial adenopathy, enlarged thymus, and mediastinal effusion.

In the case reported above the tumor was located to the superior mediastinum, and the symptoms and history pointed to its having been present for a considerable time, gradually but increasingly producing symptoms by virtue of its space-taking and pressure producing features. It failed to exhibit some of the characteristics of substernal thyroid, being fixed and showing no movement or shift of position during deglutition. It showed no features to mark it as being aneurysm. The calcifications were due to the adenomatous variations, and the marginal relief in part suggested its being of thyroid origin, yet the possibility of its being inflammatory in nature could not be entirely dismissed. Malignant neoplasm, it was felt, could be eliminated insofar as radiological findings were concerned.

The cystic and adenomatous changes present in this tumor point definitely to the inadvisability of attempting irradiation in this type of case. The calcified foci present in the tumor would likewise tend to contraindicate the use of irradiation. Generally, the rule holds that employing radiation therapy in the absence of a sound and well established diagnosis is both a hazardous and illogical practice.

Summary

A case of fetal adenoma of the thyroid gland assuming intrathoracic location is presented. Removal of the adenoma by partial thyroidectomy was followed by relief of all symptoms and uneventful recovery.

Acknowledgment

We wish to acknowledge the assistance of Dr. Charles A. Hemmer, of the Intern Staff, in the preparation of this case report.
SCIATIC NEURALGIA FOLLOWING FORCEPS DELIVERY TREATED BY LUMBOSACRAL MOBILIZATION UNDER SURGICAL ANESTHESIA

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and

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The case under discussion presented three distinct complications: Bronchial pneumonia, undoubtedly due to inhalation anesthesia, pyelonephritis, and severe sciatic neuralgia. In this paper we wish to discuss this last complication as it caused more distress than either of the others.

Case Report

The patient, a well-nourished, pregnant, married female, age 28 years, was admitted to the hospital January 1, 1943, complaining of lower back pain following a normal prenatal course with adequate treatment.

The lower back pain subsided January 2, 1943, and labor was induced January 3, 1943, by the administration of 0.1 cc. of obstetrical pituitrin at intervals of twenty minutes for a total of four doses. Labor was moderately intense and of long duration. The time from the beginning of labor until the beginning of the second stage was sixty-two hours. From the time the cervix was completely dilated until delivery of the infant was a period of 8 hours. Pelvic encephalometry revealed a borderline disproportion which was compatible with spontaneous delivery, although some delay in the progress of labor was to be expected at the pelvic outlet. The delivery of the infant was consummated by a right oblique episiotomy and the application of mid forceps. Immediately following delivery the condition of the patient was good; temperature was 99° F., pulse 138, and respirations 28. At this time a venoclysis of 1000 cc. of saline and 5 per cent glucose was given.

On the second postpartum day the patient’s temperature rose to 104°, pulse rate was 130, and respirations 25. Dr. Joseph L. Root was called in consultation, and a diagnosis of bronchial pneumonia was made. The treatment for pneumonia which was instituted included general osteopathic manipulative therapy every four hours, mustard plaster to left chest, sulfadiazine 4 grams, with soda bicarbonate gr. XXX, then sulfadiazine 1.0 gram every four hours. The patient was also given two whole blood transfusions of 500 cc. each. The recovery from the pneumonia was uneventful and the temperature declined by lysis.

The temperature again rose on the tenth postpartum day to 101.2°, pulse 125, respirations 29. The patient, then, for the first time complained
of severe pain in the right sacro-iliac articulation and gluteral area. A catheterized specimen of urine was taken when the temperature was at the peak. It demonstrated 10 to 12 pus cells per high power field and a trace of albumin. The rest of the analysis was essentially negative. At this time a diagnosis of pyelonephritis was made, as well as of a right acute traumatic sacro-iliac strain.

The sacro-iliac strain was treated by the application of diathermy twice daily, with little or no relief. Consultation was then held with Dr. C. Haddon Soden of the Department of Osteopathic Therapeutics.

Examination of the patient (in prone position) showed that the normal relationship between the right posterior superior iliac spine and the second sacral spine was disturbed. The lumbar muscles were found to be spastic. Tests for motion showed a marked restriction of the right sacro-iliac articulation, and pain was exaggerated on movement.

A provisional diagnosis of sacro-iliac strain was made. Postural x-ray study was suggested in order to determine possible variation of leg length. This examination, made on the eighteenth postpartum day, revealed sacro-iliac joint edema and early low grade arthritic pathology involving the dependent one-half of this articulation.

On the basis of the x-ray report, anesthesia reduction was advised. This recommendation was carried out under cyclopropane anesthesia. Following the anesthesia-immobilization procedure, no osteopathic manipulative treatment was given to the involved area for a period of one month. The only adjunctive therapy used was hot compresses when necessary, three times daily for one-half hour durations.

Marked improvement was noted following the corrective procedure, to the time the patient was discharged from the hospital.

A recheck of the x-ray findings was made on May 12, 1943. It was noted that the low grade pathology was still present. Anatomic deficiency in the lower left extremity length, and sacral base unleveling to the left side was demonstrated. A lift not exceeding 1/16 of an inch in thickness was inserted to attempt to level the sacral base.

**Discussion**

Postpartum sciatic neuralgia, sometimes erroneously designated as a neuritis, is not an uncommon complication following difficult labor or forceps delivery. In this case we have tried to show the efficacy of mobilization of affected lumbar and sacral segments, with the patient completely relaxed (surgical anesthesia). This patient undoubtedly had some predisposing trouble as shown by the postural roentgen studies, but there were no acute symptoms until the lumbosacral structure was traumatized during difficult forceps extraction. The relief from the sciatic pain was immediate and permanent.

**Summary**

A case of sciatic neuralgia following forceps delivery is reported.
Treatment by mobilization of the lumbosacral articular structures under anesthesia resulted in relief of the symptoms.

Acknowledgment

We wish to acknowledge the assistance rendered by Dr. Olwen Evans Forbes in the preparation of this paper.
PITUITARY OBESITY: AUTOPSY REPORT OF A CASE*

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The body types for the various varieties of obesity have been quite well described. Like the lesions of nephritis, however, one can never be too sure just what is to be found at the autopsy table. The following case offered an opportunity, among other things, to observe the reactions of an excessively obese body to unusual climatic conditions.

Autopsy No. 1791
Died: 6-27-43—3:30 p.m.
Autopsy: 6:28-43—3:00 p.m.
At the City Morgue

Clinical Data

An excessively obese, white, female, said to be 54 years old, was taken to the hospital by the District police. She was said to be "suffering respiratory failure, and comatose, thought possibly to be involved by a heat stroke." It will be noted from the weather reports of this date that the temperature was 21 degrees above normal.

External Examination

The body was that of an excessively obese, married, white female, said to be 54 years old. Her weight was estimated as being between 350 and 400 lbs. There were no marks of violence upon the body and no evidences of poisoning. The face, neck and upper regions of the trunk presented a dusky purplish color. Bloody, frothy debris exuded from the nose and mouth. An umbilical hernia several centimeters in diameter was noted.

The obesity was of the pituitary type with narrow ankles and wrists, with broad buttocks, broad shoulders, and an apron of fat hanging over the pubes a third to a half way down the thighs. The face and cranium appeared pyramidal with the apex at the top of the skull. The subcutaneous fat was 6 cm. in thickness over the chest and upper abdomen. The mammary glands were enormous in size.

Internal Examination

The chest cavities were relatively small, and the osseous cage of the thorax presented the proportions of a medium-sized female.

*Case reported through the courtesy of Dr. Herbert M. Goddard, Coroner, and Dr. Benjamin Gouley, Chief Coroner's Physician, City of Philadelphia.
The pericardial sac contained less than 25 cc. of clear fluid. The pulmonary artery contained no emboli.

The heart measured 11 x 10 x 8 cm. and weighed 400 grams. All the chambers were greatly dilated. The myocardium was soft, but it is to be remembered that the patient had died 24 hours previously, that the weather was abnormally hot, and that she was excessively obese with no evidences of refrigeration of the body. The valves of the heart presented no lesions. The coronary arteries, upon dissection, presented no narrowing; and there were no evidences of atheromatous patches. The aorta measured slightly less than 2 cm. in diameter and presented neither atheromatous degeneration nor syphilis.

The pleural cavities contained no fluids. The lungs were intensely congested and somewhat edematous. A few delicate adhesions were demonstrated over the left base of the lung.

A small diaphragmatic hernia, approximately 1 cm. in diameter, was demonstrated with a small area of the fundus of the stomach projecting through it.

The stomach was in a state of advanced decomposition but not digested through. The mucous membrane evidenced profound congestion. There was no odor of alcohol to the gastric contents.

There were no noteworthy lesions in the small, nor in the large bowel. The appendix was noted in normal position, paralleling the terminal ileum. A great amount of mesenteric fat was demonstrated, and the great omentum filled with umbilical hernial sac noted above. The amount of mesenteric fat, however, was not in proportion to the great obesity externally evident.

The gallbladder was blocked by a cholesterol solitary calculus and contained no bile. Bile could be expressed from the common bile duct through the ampulla of Vater.

The liver weighed 1600 grams, was soft in texture, and the portal vessels were stained pink.

The urinary bladder contained approximately 25 cc. of clear urine. The interior of the urinary bladder had the ribbed appearance suggestive of previous distention. The ureters were not dilated. The kidneys, right and left, measured respectively, 13 x 6 x 4 and 11 x 7 x 5 cm. and each weighed 180 grams. The capsules stripped easily. The cut surfaces showed intense congestion. The cortical substance was well preserved. There were no evidences of sclerotic changes. There were no noteworthy lesions of the suprarenal glands.

The spleen measured 13 x 11 x 5 cm., it weighed 260 grams, and was frankly emphysematous exuding large quantities of gas on section.

The pelvic viscera presented no noteworthy lesions. The uterine cervix was uninvolved by tumor.

The cranial cavity was small, and the distortion of the face was found
to be due to fatty deposits below the level of the zygomas. The brain presented cortical congestion with no other noteworthy changes. The dorsum sella was softened and readily pulled away with forceps. The pituitary gland measured approximately $2 \times 2 \times 2$ cm, and weighed approximately 2.5 grams. The pituitary was composed essentially of a cystic space filled with mucoid material with only a small margin of pituitary tissue about its edges.

A peculiar pinkish discoloration of most of the tissues of the body and, particularly, the intima of the aorta was demonstrated as evidence of decomposition products resulting from the invasion by B. Welchii. Likewise, a peculiar cyanosis was demonstrated involving many of the internal organs as well as the face, neck, and upper trunk. The cortex of the brain presented a similar cyanosis. Intense congestion was demonstrated in the internal organs, all of which lead us to believe that the mechanism of death was essentially heat shock or heat exhaustion.

**Anatomic Diagnosis**

- Acute Dilatation of the Heart (all chambers)
- Heat Shock
- Pituitary Obesity
- Pituitary Cyst
- Cholelithiasis
- Chronic Cholecystitis
- Umbilical Hernia
- Diaphragmatic Hernia

**Case of Death**

Immediate—acute dilatation of all chambers of the heart, due to heat shock.
Contributory—pituitary obesity.

**Discussion**

This autopsy presented many features of great interest to students and instructors alike. The gross body type was at once striking. The obvious suggestions of pituitary disease could hardly be missed. The reaction of this excessively obese individual to high temperature and humidity was evident. This latter is almost impossible to comprehend outside of the coroner's department, since these cases cannot be examined elsewhere. The biliary calculus was most striking, very irregular in shape, it gave the appearance of interlacing palisades, and was composed of almost pure cholesterol. Cholesterol calculi are usually egg shaped.

Without doubt, all of us were most impressed by the body type after the heavy layers of fat had been dissected away. Within this huge body the skeleton and body cavities were cast in a delicate mold. Even
the cranial cavity was that of a petite, small woman. It was our impres­
sion that at some time in this individual’s history she was a rather small
woman, this monstrous metamorphosis having been brought about by the
pituitary disease.

Summary

An autopsy protocol of pituitary obesity with the demonstration of
a pituitary cyst is detailed.

The reaction of an excessively obese individual to high temperature
and high humidity is noted.

The finding of a small skeleton and small body cavities cast in a
delicate mold within a huge outer casting of fat in pituitary obesity is
noted.
A FLANGED PARAFFIN BLOCK HOLDER DESIGNED TO BE ATTACHED WHILE MOULDING THE BLOCK

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It is customary when sectioning a tissue in a paraffin block by rotary microtome to attach the block to a suitably sized object holder. This holder consists of a metal plate with a round metal shaft perpendicular to the center of one surface of the plate. The plate is embedded in the back of the block to be cut by warming it in a flame, next pressing it firmly to the block, and then plunging the two into cold water until the metal cools and the paraffin hardens. The block and the holder are thus firmly united; the shaft is placed into the chuck of the microtome and sectioning proceeds.

This method of attaching the block to the holder has no apparent disadvantages when the whole block is to be sectioned, as is done in embryology and histology laboratories. For the histopathology technician, who takes only two or three representative sections from each block and sections many blocks in a day, a disadvantage does exist. This is the time consumed in detaching the holder from the sectioned block and attaching it to the next block to be sectioned.

To obviate this, it was decided to embed the holder in the paraffin at the time the block was being moulded. In order that the holder might be supported in proper position in the melted paraffin while it cooled, a flange was placed upon the shaft. (Figure 1.) This flange rests upon the edges of the mould. (Figure 2.)

Enough flanged holders were made so that the worker can embed a holder in every block while moulding it. The time formerly used in heating each holder and embedding it in a previously moulded block is, by the new method, saved for other uses.

At first, in the development of the idea, the buying of a couple dozen object holders and the fitting of these with removable flanges was contemplated. Trial of two object holders with removable flanges revealed that permanent ones would be best. The reasons were three. One was price. A second was the fact that the flange was difficult to remove after becoming more or less coated by paraffin. Thirdly, there existed no reason for their removal. The presence of the flange did not interfere with sectioning in any way.

The permanent flange is fastened to the object holder by shrinking it onto the shaft. This is done by drilling through the middle a hole slightly smaller than the shaft. The shaft is next cooled with ice, while the flange is being heated. The hot flange is then slipped over the cooled
shaft to the desired point. This is usually not very difficult. The flange and holder are then brought to the same temperature by plunging them into tap water. This expands the shaft and shrinks the flange. The union of the two is permanent. Welding is not necessary.

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Fig. 1—Standard paraffin block holder without flange, and modified paraffin block holder with flange.

**Summary**

The development and use of flanged object holders for attachment to paraffin blocks while in the process of being moulded has resulted in a lessening of work and a saving of considerable time in our histopathology laboratory.
Fig. 2—Modified paraffin block holder, with flange, being embedded in paraffin block during the process of moulding.