wheels, pulleys and journals, then he inspects all pipes conducting water to his boiler and all pipes conducting steam to the chest. He examines safety and mud valves to know that they are ready to do normal work, then he inspects the furnace to know that here all is in proper order and in condition to throw the greatest amount of heat to the boiler. After making all corrections he fires up, starts the engine and if the answer is perfect work he knows that he has done his duty. For fear that something might give way he keeps his eye on the machinery for a few hours or days that he may feel satisfied that it is in good working order. He knows where and how the power is generated, how applied, and the uses of all the parts of the machinery.

74 Can an osteopath afford to ignore the sacred truth just illustrated by comparison when called upon to inspect, find and correct the cause of such friction as will result in imperfect action of the powers and principles of the human body? As a mechanic, I say no. His talk and work will prove him to be a dangerous person with whom to intrust the sacred work of life in all departments of the human body. This subject is too serious not to come under the most crucial and exact requirements of which human skill is master. If a mechanic is so particular to inspect every part and principle belonging to a steam engine for the purpose of getting good results, can you as an engineer omit any bone in the body and claim to be a trustworthy engineer? Can you say that any part has no importance physiologically, in this the greatest engine ever produced—the engine of human life? The operator is to remember the responsibility hanging over his head when he is in the sick room. You must reason, or fail. A hint to the wise is enough. I have given you a compass that will guide you out of many dark places. This is as old as all ages and as trustworthy in the hands of an osteopath as multiplication is to the mathematician. I want to emphasize to the student or operator the absolute unqualified importance of knowing the duties and personal responsibilities of a bone in keeping up its part as a laboratory and building.

Variation and Adjustment of Bones

75 As I am talking to mechanics who have a comprehensive knowledge of the human body and all of its machinery, powers, principles and motions, I shall talk in plain English. The mother language is the only language in which we can successfully think. We say head, neck, skull, bone, jaw, back bone, ribs, collar bone, shoulder blades, hip bones, thigh bones, shin bones, bones of the feet, bones of the arm, bones of the hand, and so on.

Now I will talk to you about bones. If you are an American you do not know what 'os' is because it is out of your language. When I say 'os' or 'osseous system' you do not think 'bones' at once. I will say muscle, skin, hair, and when I talk English to you and tell you to go and adjust an abnormal condition, if you understand your anatomy, I am not disappointed when I inspect your work. 76

If the normal position and relation of every bone from the crown of the head to the sole of the foot is a condition necessary to good health, what variation from a socket, facet or any joint will be the cause of some progressive disease such as a fever, tuberculosis, or inflammation of any joint of the neck, back, loin, hip, legs or arm? Can you as an engineer reconciled to your knowledge of a twist of a bone from its normal position, not see that such a slight movement would carry a muscle, both ends of which are fastened, backwards or forwards sufficiently far to produce an unnatural crossing of those fibrinous strings, muscles or tendons that unite a rib with the spinous process, or that unite other parts? Don't you see that in this condition there is a great strain and irritation at the point where one muscle crosses another? Don't you reason that normal vital action is suspended from this point back to the spinal cord or ganglion from which the nerve of this muscle is sent off, and beyond this point this vital action is a failure? As an engineer you see friction, as a philosopher you conclude there is an obstruction, and as a mechanic you remove the obstruction by so adjusting the bones that no strain is on a muscle causing it to press on another muscle, blood-vessel, ligament or nerve. 77

When you are combatting effects such as diseases of the scalp, brain, eye, ear, tongue, throat, lung, heart, liver, spleen, pancreas, stomach, bowels, kidneys, bladder, womb, or limbs you will arrive at a trustworthy conclusion as to cause if you use the method of reasoning just outlined. There is no part that I have named which if affected by disease does not present a philosophical question to be answered by an engineer and not by an imitator nor a masseur. The friction or cause that has produced the disease must be removed and normality established. An honest, thoroughbred, well-qualified engineer knows by his qualification and experience that each variation from normal action in an engine has a definite cause, and the friction of a pulley should never be treated at the steam chest. He must have the power of reason to hold perpetually before his eyes a perfectly normal image of any part of the human bony system, then he can judge just what is the cause of the malady he has to contend with. 78

Here is a list of leading questions to ask the mechanical critic, the philosopher and the engineer who can reason from the effect or friction to the cause producing such effect. Why do one person's eyes when 79

congested become abnormally large and a constant stream of tears pass from them? Where is the friction responsible for this unnatural appearance of the eye? Would you go to the nerve and blood supply of the eye for the cause or would you cut those eyes out and throw them away? If you have polyps or adenoid tumors of the nose, would you take the tongs and pull out some nose this month and some more nose every other month or would you go to the nerve and blood supply and the drainage and regulate them? If you were consulted on a case of enlarged tonsils would you take your knife out of your belt, whack them off and throw them away or would you go to the atlas and axis as a sensible engineer, and give Nature a chance to reduce the tonsil to its normal condition? You must know first, last and all the time that if the blood could have passed to and from the head without obstruction there would be no tumor.

80 Suppose there should be inflammation and soreness of the trachea and esophagus, would an engineer account for the friction by imperfect blood and nerve action or would he swab the throat with destructive caustic and other poisons? Would an osteopath accept such conclusion or action as a truth or would he book such procedure as ignorance of cause and effect? Suppose an engineer who knows his business is consulted on what is known as pleuro-pneumonia, and the lungs are laboring under much excitement and congestion. Would that engineer fire up with hot water bags, administer morphine, whiskey, digitalis, strychnine, or would he explore the spine and ribs from the diaphragm to the head for slips, strains, and dislocations of the bones of the spine to know why this shut-off from the blood and nerve supply and to know why the pneumogastric could not do its normal work and allow the blood to pass to and from the brain, pleura and lungs?

81 An engineer who knows his business does not hesitate to proceed at once to adjust all parts of the neck, and passing down from the head and neck he adjusts all parts to the dorsal. Would he be satisfied to stop his work without knowing to a certainty that the clavicular articulation is absolutely correct or would he leave the clavicle sufficiently far back off the acromian process to shut off the jugular vein so that it could not deliver venous blood to the heart? He knows that he is dealing with a train that is running very fast, and from the condition of the road it will soon be ditched if he does not adjust his engine and do it very quickly. His object is perfect drainage from head, face, neck, pleura, lung, intercostals and all parts of the thoracic division. He knows that when all pressure is removed from the pneumogastric, harmony will follow in its action; that when the resistance caused by closure at the point where the ascending carotid enters the head is taken off, the unnecessary labors of the arterial

system will stop because the veins or mud valves are doing trustworthy work. Then breathing and heart action become normal. Relief and recovery are sure to follow if the engineer knows and does his work.

Mr. Engineer, allow me to ask you a few more questions that I think are of the greatest importance to the success of the science of osteopathy. I have asked you questions in reference to the head, face, eyes, neck and organs of the thorax and I think you are worthy and well qualified to take charge and safely run this engine so far as the organs above the diaphragm are concerned. Now a few hasty questions in reference to the liver. When the nerve and blood supply to this important organ are good, is that all that is necessary for it to do good work? You say yes, give me nerve force, blood supply, drainage, and plenty of nourishing diet and I will guarantee the results to be good and satisfactory. Suppose there should be enlargement of the liver, what conclusion would you come to? I would say at once if there is no mechanical injury to contend with that a failure of the venous drainage causes this congestion and overgrowth. Would you suggest purgatives, stimulants, dietetics, going to the mountains, pukes, blisters and hot bags? I would not, I would explore the nerve and blood supply and drainage of the whole hepatic system. I would correct all bony abnormalities, give my patient rest, plenty of good wholesome food and expect to soon have a liver normal in all particulars, provided I am called in reasonable time and the patient is not exhausted and disabled from poisonous drugs. The same rule is just as good and trustworthy in diseases of the spleen, pancreas, stomach, bowels, kidneys, uterus, bladder and limbs. 82

One asks, how must we pull a bone to replace it? I reply, pull it to its proper place and leave it there. One man advises you to pull all bones you attempt to set until they pop. That popping is no criterion to go by. Bones do not always pop when they go back to their proper places nor does it mean they are properly adjusted when they do pop. If you pull your finger you will hear a sudden noise. The sudden and forceful separation of the ends of the bones that form the joint causes a vacuum and the air entering from about the joint to fill the vacuum causes the explosive noise. That is all there is to the popping which is fraught with such significance to the patient who considers the attempts at adjustment have proven effectual. The osteopath should not encourage this idea in his patient as showing something accomplished. 83

Another asks, how do you set a hip or any other dislocation, partial or complete? You have asked a big question which requires a correct answer. Previous to readjusting any bone of the body, it matters not which one it is or how far it has been forced from its socket, you must first loosen it at its attachments as its articulating end, always bearing in mind that 84

when a bone has left its proper articulation the surrounding muscles and ligaments are irritated and keep up a continual contracture.

85 We have a thigh bone out of its socket and pressed very closely to a point on the surface of the ilium. Bend the knee very slightly, place one hand under the foot and the other hand under the trochanter major; with the hand at the foot while the leg is bent, push knee up towards patient's face; put your chest or chin against the knee and with the hand under the foot pull towards you and with chin or chest push knee from you. At this time the head of the femur has been pressed or twisted out from the ilium. Now with the hand at the trochanter you have head of the femur within range of its socket, so bring the lame leg over and across the knee of the well leg; pull down slightly on the foot and as you take the lame leg off the sound knee straighten the leg out and the hip is set without a pop or pain, as the hand under the trochanter major has suspended sensation in the limb. This is one of many methods of setting a hip. Without going into detail further I will say that all dislocations, partial or complete, can be adjusted by this rule: First loosen the dislocated end from other tissues, then gently bring it back to its original place.

86 In setting a shoulder, after a thorough loosening at the articulation, use but little force to push the elbow towards the contracted muscles at the shoulder then rotate the humerus into its socket.

87 I will say to the student of osteopathy, to judges, jurors, lawyers and all interested, that there are many ways to set bones; there are many ways to bring them from their abnormal position back to their normal articulation. In adjusting bones the mechanic is governed by three principles—the lever, the screw and the wedge. To remove a bone or any substance from its position the mechanic seeks to find and make a fixed point then he makes use of the principle of the lever, the screw or the wedge and with his hands gets the movement desired.

88 A partial or complete dislocation of any bone becomes a weight or resisting power. The hand or any other substance may be used as a fulcrum. Then the rib, femur or any other bone becomes your lever, and by applying your power outside of the fulcrum the weight or resistance can be overcome.

89 I am often asked how I would adjust the spine or ribs in asthma, in lung and heart trouble. In cases of asthma one of my methods is to place my patient's back against the door-facing. The door makes a fixed point against the back and holds it firmly in position. With my fingers on the rib or ribs that are above or below the articulation with the transverse process, I take the arm back and up with considerable force. This movement of the arm is to put the serratus magnus muscle on that side on

a strain which helps to draw the rib up. After holding my hand firmly against the rib while the arm is in that position I swing the arm back and down.

Another method I use is to place my patient on his back on the table 90
and bring the arm on the affected side out at a right angle. Then I place my thigh close up in the axillary region and push the arm upward putting the serratus magnus on a strain as before. At the same time I pass my hand back of the shoulder and place my fingers on the affected rib and push up or down as the case may require. These are two methods but there are many more that I think are just as good.

I want to make it plain that there are many ways of adjusting bones. And 91
when one operator does not use the same method as another, it does not show criminal ignorance on the part of either, but simply the getting of results in a different manner. A skilled mechanic has many methods by which he can produce the desired result. A fixed point, a lever, a twist, or a screw power, can be and are used by all operators. The choice of methods is a matter to be decided by each operator and depends on his own skill and judgment. One operator is right handed, the other left. They will choose different methods to accomplish the same thing. Every operator should use his own judgment and choose his own method of adjusting all bones of the body. It is not a matter of imitation and doing just as some successful operator does, but the bringing of the bone from the abnormal to the normal.

Some Mechanical Injuries and Their Effects

A wound or injury, when sufficiently severe, will produce sudden death. 92
A gun-shot wound or a wound with a knife or bayonet often produces instantaneous death because of the magnitude of the nervous shock. This truth is very evident when the wound is in the brain, because the whole nervous system depends upon the brain for force and nourishment. When a knife or bullet passes through a chamber of the heart and spills the blood out it is certain to produce death, for we have a perverted action, a stoppage of the arterial blood flow. We have death from shock to the nervous system which has been depleted by loss of blood.

So far we have been dealing with wounds centrally located. Now we will 93
change the location of wounds placing them in the flesh of a finger, hand or arm. These by their progressive action reach the two centers or