

over the first piece of the sternum, and to a variable distance on either side of this. Then a heaving prominence makes its appearance in the same region, and, following upon the absorption of the sternum and upper ribs, an external tumor becomes developed which may even reach a large size. The radial pulses of the two sides quite frequently differ in size and fail to beat with the usual synchronism. This sign is more often met with in aneurisms of the arch, because here the innominate and subclavian arteries are so apt to have their calibre interfered with by pressure, by twisting or dilatation, or by the entrance of coagula. The parts most liable to compression in these cases are the œsophagus, trachea, recurrent laryngeal nerve, and left innominate vein. If the concave border of the arch be also involved, the left bronchus is liable to be partially or wholly obliterated. The signs by which these various conditions can be recognized have been already considered. Rupture occurs into the trachea, the œsophagus, or the pleural cavity, or more rarely into the mediastinum, the pulmonary artery, or one of the large veins.

Aneurisms of the innominate artery alone are rare, but we oftener see tumors of the arch associated with more or less considerable dilatation of the innominate trunk. The enlargement will be found beneath the right sterno-clavicular articulation and inner part of the first rib, and it may extend into the neck beneath the sterno-mastoid muscle. In these situations we must look for the usual local signs, swelling, pulsation, and bruit. The latter may be heard up the carotid. The effect upon the distal arteries is generally well marked. The symptoms are chiefly pain, both local and more especially radiating up the right side of the neck and back of the head, sometimes down the right arm, with numbness; and if the tumor be larger, there will be signs of compression of the trachea or the œsophagus or an innominate vein. Cases sometimes arise in which it is extremely difficult to determine whether the disease is confined to the innominate artery or occupies as well a portion of the arch at the origin of this vessel. For instance, a man came under observation a short time ago at the Montreal General Hospital, with a strongly pulsating tumor rising out of the neck above the right sterno-clavicular articulation. Dr. Fenwick, whose patient he was, believed it to be purely innominate. Its strict limitation to the area near this vessel, the distinctness with which the cylindrical tumor could be defined by the examining finger, the interference with the pulsations in the radials, and the absence of all signs of swelling of the arch, as determined by most careful examination, all seemed to favor this conclusion. This opinion was confirmed at a consultation of several members of the staff, and it was decided to recommend treatment by distal ligature. This the patient refused to submit to, and was discharged. He subsequently died suddenly, while running, from rupture into the pericardium of a small aortic dilatation just above the valves. The aneurism in question was found at the autopsy to be entirely aortic. A remarkably elongated sacular dilatation sprang from the arch directly behind the innominate artery (somewhat compressing it) and appeared above the inner edge of the clavicle. The innominate was completely pervious and of normal size. The deception was complete and would have given rise to a grave error of treatment had the patient consented. Although, as in the case just related, mistakes of this kind are sometimes quite unavoidable, yet, in the majority of cases, a thorough investigation of all the symptoms and physical signs will suffice to make a diagnosis.

Aneurisms of the descending thoracic aorta are less common than the others. They also may be cylindrical or sacular. From the depth at which they are situated in the chest, and from the thickness of the structures everywhere surrounding them, they are difficult of detection, and as the symptoms from them may be only slight and ill defined, they may continue for a long time unsuspected. Pain is, however, seldom absent, and, if long continued, points strongly to aneurism. This point has been already sufficiently dwelt upon. The earliest physical signs con-

sist in localized dulness to the left of the spine, and enfeebled breathing over the same area. Later on, a systolic bruit may be heard. Occasionally, retardation of the left femoral pulse, as compared with that of the radial, has been observed. When of large size, the aneurism pushes the heart forward, and the heaving impulse of the tumor can be felt anteriorly through the heart. A rare symptom is dilatation of the veins on the anterior aspect of the chest from pressure upon the azygos and intercostal veins. Lying against the vertebral bodies, these aneurisms very commonly produce erosion of those structures; and if this be sufficiently considerable, bending of the vertebral column occurs, with posterior curvature. From this cause, or from opening of the vertebral canal, pressure is sometimes brought to bear upon the spinal cord itself, with a resulting paraplegia. The œsophagus is sometimes compressed and dysphagia produced. Attacks of pleuritis in the lower part of the left side are a very frequent accompaniment. These usually result in plastic effusion, but, at times, even pretty considerable quantities of serum may be found. Some years ago I found a hospital patient complaining of stitching pain in the left side. Very moderate effusion was determined by physical examination. There had been slight pain in the back for some time previously, but this had not been of sufficient duration or intensity to lay stress upon. The fluid continued to collect, and was removed by aspiration, with relief. A few days afterward he died suddenly from rupture of an aneurism of the descending aorta into the same pleural cavity.

Rupture of these aneurisms occurs most frequently into the left pleural cavity, sometimes into the right, and occasionally into the œsophagus. Cases are known in which the sac opened into the spinal canal.

DIAGNOSIS.—The recognition of thoracic aneurism is just as easy in some cases as it is difficult in others. During the past decade it has become more generally recognized that a not inconsiderable number of cases of aneurism are entirely latent. An important advance in the recognition of such cases has been made by the application of the *x*-rays. Cases otherwise obscure can be cleared up by these remarkable rays, and when aneurism is falsely suspected an *x*-ray examination may disprove its existence. Observations are best carried out by means of the fluorescent screen, when a distinct enlargement lying in the course of the aorta is detected. Pulsation is sometimes observed, and, when present, strengthens the view that an aneurismal tumor is present. Williams states that the movements of the diaphragm are often less on the left side, due probably to pressure on the left bronchus. Care must be exercised not to mistake enlarged glands or other intra-thoracic tumor for aneurism. Such an error is only likely to occur when the growth lies in contact with the aorta.

Superficial, strongly pulsating aneurisms are readily observed, and not unfrequently the throbbing will have been noticed by the patient himself. On the contrary, deep-seated dilatations may give no appreciable physical signs, and in that case the diagnosis may be obscure. Furthermore, if, in one of these obscure cases, the aneurism causes no symptoms by its pressure, then the diagnosis becomes impossible. Not a few aneurisms of the ascending arch, even of considerable size, prove the cause of sudden death in persons previously believed to have been in good health. These, having caused no symptoms, had never been looked for, but could undoubtedly have been detected by physical examination. The combination which gives the greatest certainty to the diagnosis of thoracic aneurism is the union of physical signs of tumor with pulsation in the course of the aortic arch, together with some, or best, several, of the pressure symptoms enumerated. The difficulties in the diagnosis of these cases arise from the great variability which is met with in the manner in which these different indications may be grouped together. Thus we meet with cases in which some of the physical signs of aneurism are observed, and no pressure symptoms; others, again, in which there are evident pressure symptoms,

with perhaps only a few of the signs of aneurism. In not a small number of cases the conditions lead to the recognition of an intra-thoracic tumor, and the difficulty begins only when we endeavor to differentiate between a *solid tumor* and an *aneurism*. The resemblance between an aneurism and a solid tumor placed between the chest walls and the aorta may be very close. In both there may be dulness on percussion, pulsation, and a recognizable bruit, and pressure symptoms of identical character may also be present. The chief points of distinction are the following: In the case of the neoplasm, the dulness is likely to be less clearly restricted to the aortic region, the pulsation will not be at all so forcible, and the systolic bruit will probably not be followed by an accentuated second sound. Bronchial respiration is commonly heard over a solid tumor, while enfeeblement or silence is the rule in aneurism. Again, persons with aneurism are not likely to suffer severely in their general nutrition and appearance, while the contrary holds good with reference to nearly all forms of intra-thoracic solid growth. Attention to the following points may also assist the investigator in doubtful cases. Aneurism is many times more frequent than solid tumor. It occurs much more often in men than in women. It is favored by a history of rheumatism, strain, alcoholism, or syphilis. (Fifty per cent. of patients with aneurism have had syphilis.)

Pulsating empyema is a rare condition, which sometimes simulates aneurism. The chief physical signs to be here met with will be dulness on percussion and local pulsation, but no pressure symptoms will be present. Examined closely, the dulness will be observed to be less clearly localized in the aortic region than is that of an aneurism. Moreover, other signs of arterial disease will be wanting, and, on the other hand, there will be some evidences of disease in the pleura or the lung, accompanied by a certain degree of constitutional disturbance. These differences will usually suffice to prevent error. Puncture with a fine aspirator needle will, in any case, clear up the diagnosis.

Violent throbbing pulsation of the aorta in cases of severe aortic regurgitation often leads to a suspicion, or even to an erroneous diagnosis, of aneurism. The pulsation, however, has not the heaving character of aneurism, and there is an absence of pressure symptoms.

PROGNOSIS.—It is usually a matter of considerable difficulty to form a satisfactory opinion as to the prospects of life of a person suffering from thoracic aneurism. Undoubtedly the disease generally tends to prove fatal, and is actually the immediate cause of death in the majority of cases; and yet, in a certain number, increase in the tumor is arrested and moderate health is enjoyed for perhaps a period of several years, even then the fatal event being brought about by some affection entirely independent of the aneurism itself. It is often clearly impossible to estimate at all accurately the size of a deep-seated tumor, or the degree to which it may lie against important adjacent organs; and hence ruptures in various directions, which no skill could possibly foresee. Those aneurisms which arise from the root of the aorta are the most dangerous, as they tend most frequently to rupture while yet small. Those of the ascending arch—if they grow forward and to the right—are calculated to permit of the longest tenure of life. Those of the transverse arch and descending thoracic aorta are probably, on the whole, more favorable than the first and less so than the last; the reason for this, of course, being their greater proximity to numerous important structures, which can hardly escape from injurious pressure. Our opinion, therefore, of the probability of the prolongation of the patient's life must depend upon the situation of the aneurism, the fluidity or the contrary of its contents, and the presence or absence of symptoms of compression, to a serious extent, of the surrounding parts. If this be well marked upon the trachea or œsophagus, a fatal result may be anticipated before many weeks or months. Other conditions to be considered are the following: Mode of life; if a person with aneurism is

obliged to earn his living, and especially if the occupation followed is at all laborious, his chances of living will be far less than those of his more favored fellow who is able to live at ease and free from care. Rest is so important in these cases that if this cannot be secured the disease is almost sure to be progressive, and perhaps even to advance rapidly, while, on the other hand, it seems sometimes surprising how long the fatal end can be averted, even in advanced cases, by the observance of great precautions in this respect. This remark will also necessarily apply to the cases of patients who, from irritability of temper or other similar causes, refuse to carry out this essential principle of their treatment. The temperament of the patient is of importance, for anger, excitement, and, indeed, any violent reaction may be followed by the most serious results. Indulgence in alcoholic liquors is sure to interfere with the quiet action of the heart which is so desirable; intemperance must, therefore, influence strongly our prognosis.

Associated Conditions.—In estimating what is likely to be the future of any given case of thoracic aneurism, it is important to study carefully any pathological conditions which may be associated with it—such, for example, as affections (especially valvular) of the heart, of the lungs, of the larynx, of the bronchi, etc.—and to assign to each its true value as a factor in the problem. Finally, the general condition with reference to nutrition, muscular development, digestion, etc., must also take its place in rendering the prognosis either more or less favorable.

TREATMENT.—Aneurism within the chest is capable of the same spontaneous cure which occurs occasionally elsewhere. Complete coagulation and hardening of the contents, with arrest of all symptoms, is, however, extremely rare. Still it is always obviously a duty to endeavor to place a patient who is the subject of this formidable disease in as favorable a position as possible for this process to occur. All treatment, therefore, which is not merely palliative should be directed toward insuring conditions likely to promote firm coagulation within the sac.

In the large majority of cases of intrathoracic aneurism we are, from the nature of things, precluded from those methods of treatment which are applied directly to the tumor itself or its immediate neighborhood, and are frequently distinctly curative. We are, on the contrary, compelled to treat these cases by general measures and by such indirect means—drugs—as experience has proved to be of value. The objects in view may be briefly stated to be to reduce the tension within the aneurism, to secure regularity of the heart's action without frequency, to maintain the blood in good chemical condition without undue bulk, and to favor thickening of the sac's walls. To follow out these indications it is necessary to secure the full direction of the case for, perhaps, several months. If the physician, therefore, is to meet with any success, it is absolutely requisite that he should have the hearty co-operation of the patient, who, if sufficiently intelligent, must be made acquainted with the nature of the case and the urgent need of his assistance, irksome though he may find it to be.

The recumbent position, for a length of time, is always to be recommended. The effects of this measure alone are often sufficiently striking. When the person's circumstances permit, the restriction to a lying posture should be absolute, and should be persisted in for several months, unless the general health appear to be suffering materially from the close confinement, when, with due precautions, sitting up and slow walking may be permitted. If, on the other hand, circumstances prevent absolute rest from being carried out, then, at any rate, very stringent rules must be insisted upon, governing the patient's entire mode of life, with the view of insuring the least possible muscular exertion. This is a point on which too much stress cannot be laid. These patients live constantly on the edge of a precipice, yet, when immediate suffering is relieved, this fact is too often lost sight of, with disastrous results. A patient whom I

treated during a year not long ago, for an aneurism of the ascending arch, was so far benefited that he took a situation as a messenger. In spite of all warnings to the contrary, he soon undertook to handle heavy baskets and other packages. One day, shortly after, he experienced sudden pain in the chest, followed by the extraordinarily rapid development of an external tumor. This quickly attained the size of a child's head, and proved fatal, with great suffering. Hardly less important than physical rest is mental quietude. Habitual worries of all kinds should be as much as possible excluded, while actual excitement is in every respect highly dangerous. A fit of anger or other violent emotion may prove fatal, either by actually causing rupture of the sac or (as in a recent case of my own) from syncope.

The diet is a matter of importance. A very old treatment of aortic aneurism is that of Valsalva, in which repeated blood-lettings were practised, together with a gradual restriction of the food until the amount of this was brought within the lowest possible limits short of actual starvation. The fallacy of this proceeding has, however, been long ago demonstrated. Blood-letting has but little, or but a temporary, effect upon the blood pressure; and the withdrawal of food causes anæmia and weakness, with irritability of the heart and impaired nutrition of the arterial walls, which conditions indirectly aggravate the disorder. The result of experience shows that the formation of a coagulum, which is likely to be of service in the process, will proceed better if the patient be not too much reduced. Tufnell, of Dublin, is the only comparatively recent writer who has advocated the starvation plan. Conformably with his recommendation, the system has been extensively tried, but few are found who can report results calculated to lend support to its efficacy. As much nourishing food should be allowed as can be thoroughly digested, due allowance being made for the weakened digestive activity that results from the enforced rest in bed. If the patient be plethoric and show evidences of congestive tendencies, then our treatment may well be begun by the adoption of depletory measures for a time—a low diet with laxatives or saline purgatives.

As regards medicines, many have been tried, but few have proved useful. The most valuable drug is undoubtedly iodide of potassium. The good effects of the iodide were described by Dr. Chuckerbutty in 1862, and by Dr. Roberts in 1863, and they were emphasized and enlarged upon by Dr. George Balfour a few years later. Since that time it has been extensively employed, and has continued to grow in favor. The two former writers considered that it acted by inducing increased coagulability of the blood, but this view is not shared by Dr. Balfour. He considers that the iodide has "a peculiar action on the fibrous tissue, whereby the walls of the sac are thickened and contracted, while if coagulation should take place within the sac, it plays but a very secondary and unimportant part, depending for its occurrence solely on the remora of the blood, and is in no respect due to the iodide of potassium." This corresponds entirely with the results of my own observations, for in one case, in which the relief to pain and the general improvement had been very marked for a long time under this treatment, the autopsy subsequently showed that not a particle of fibrin had been deposited on the walls of the sac. Dr. Bramwell suggests that it acts by reducing the blood pressure and relieving the tension within the sac. The symptoms which specially indicate the use of the drug are pain and troublesome cough. The special pains of thoracic aneurism are generally very rapidly allayed, and are often for a great length of time held in abeyance by this agent; and the same may be stated with reference to the troublesome attacks of irritating cough which the tumor may excite from time to time. Independently, however, of its employment for the relief of these urgent symptoms, it is to be administered steadily for such a time as may be thought necessary to influence, as above, the disease itself. The dose usually given varies from gr. x. to gr. xxx. thrice daily. Balfour, who formerly inclined

to the larger dose, thinks now that fully as good effects can be obtained from smaller ones. His rule is to employ such a quantity as will lower the blood pressure without increasing the frequency of the cardiac contractions. Beginning with ten-grain doses, ascertain the pulse rate (the patient being recumbent), and increase to fifteen; if no increase in the pulse be observed, this is to be continued; but if the pulse gets quicker, then return to ten. It is rare that more than fifteen grains can be borne within the limits of this test. The treatment must be persevered in, at the least, for several months, and, to give it a fair trial, probably for a whole year, or even longer. If troublesome eruptions are produced by the potash, an intermission must be allowed till these are recovered from. It is also well to remember that some persons who are thoroughly intolerant of iodide of potassium can take iodide of sodium without any outward effects. Dr. Balfour speaks truly when he says the results (from iodide treatment) "are extremely encouraging; and when we reflect upon the entire absence of any risk to the patient from the treatment, and the almost certainty of relief to his sufferings and prolongation of his life being at least attained, I think I am warranted in saying that no treatment for internal aneurism hitherto devised holds out anything like an equal prospect of relief, if not of cure, with that by the iodide of potassium."

Tannic acid and acetate of lead have both been given with a view to promote coagulation within the sac and to favor contraction of its walls. No reasonable degree of success has followed in either case, even although the latter salt has repeatedly been pushed to the production of full toxic effects. I have tried it in one case of aneurism of the abdominal aorta, continuing its use until a deep blue line appeared on the gums, but without any noticeable change in the size of the tumor or the strength of the pulsations.

Ergotin, given internally (or by hypodermic injections), on theoretical grounds, to contract the vessel, has failed to produce any reliable results.

The hypodermic injection of a one-per-cent. solution of gelatin in normal saline solution has been strongly recommended by Lancereaux, with the view of causing coagulation in the sac. From 50 to 100 c.c. may be injected beneath the skin of the buttock, or thrown deeply into the muscles. There is sometimes considerable local pain and even general febrile reaction after this procedure. Although successful cases have been reported, the method is by no means free from danger. Serious and even fatal results have followed the injections, owing to the detachment of large emboli. The method is, therefore, not likely to come into very general use.

Mr. Christopher Heath and a few others have suggested and practised ligature of one or more of the great branches of the aortic arch, the object, of course, being to retard still further the blood current and thus promote coagulation. Some support is given to this procedure from the benefit that has been observed in certain cases of aortic aneurism in which the carotid and subclavian of the right side had been ligatured, under the impression that the disease was confined to the innominate artery. At most it would be applicable only to cases in which the tumor was sacculated and either involved the root or was situated close to the origin of some of the great vessels. Evidence of extensive atheromatous disease would preclude any prospect of advantage from this surgical procedure.

Attempts have also been made to produce rapid coagulation of the blood within the sac by the introduction therein of foreign bodies. Fine iron wire, watch-spring, and horsehair have been employed for this purpose. The results, however, have been more or less disastrous. The coagulum thus formed is soft or friable, and consequently very liable to the detachment of emboli, and moreover it is actually loose in the centre of the sac, instead of being regularly laminated upon its sides. Inflammation of the sac is liable to occur, and as there are no means of keeping this within the bounds of safety,

it may itself cause dangerous symptoms. With the use of strict aseptic precautions this risk is, however, reduced to a minimum. The principle seems faulty, and the absence of good results has caused the treatment to be abandoned.

There still remains to be mentioned a form of treatment which has seemed to be of service in a few cases of otherwise desperate character. That is *galvano-puncture*. The use of electricity in this way is permissible only after a fair trial, for a sufficient length of time, of complete rest and iodide of potassium. It is advised in sacculated aneurisms which are situated near the surface of the chest, have resisted treatment, are rapidly enlarging, and threaten soon to rupture. This method, in suitable cases, has met with a certain measure of success, but it has much more frequently failed of its object, in some instances even having caused dangerous inflammation of the sac, and in others having hastened the occurrence of rupture. For galvano-puncture it is necessary to employ a battery of considerable strength, the Leclanché or Stöher element being what is generally preferred. Experiments have been made with one needle only or with both introduced within the sac. From these it seems to be generally admitted that it is necessary to pass in only one or two needles connected with the positive pole, while the negative is attached to a flat metallic electrode on the surface of the abdomen. It is recommended either to continue the current for a short time only, say twenty or thirty minutes, by which time a small clot will have formed, and this will constitute a nucleus for further deposition; or else to allow the current to pass for a time sufficient to coagulate the entire contents of the aneurism, say for two or three hours. It may be necessary to repeat the operation after an interval of some days.

Another method of producing coagulation within the sac has been suggested by Macewen: A needle is introduced into the sac and the inner wall scratched with its point. The object is to produce an exudation of leucocytes with the formation of firm, white thrombi. The needle should never be left in for more than forty-eight hours and often for a shorter time. It is sometimes necessary to repeat the process several times. In the case of large aneurisms several needles may be introduced so as to irritate a large portion of the lining of the sac. This method has been employed in too small a number of instances to warrant us in drawing any trustworthy conclusions as to its value.

The method of all others which seems to hold out the greatest prospect of success, when it is decided to penetrate the sac, is that first suggested by Corradi. It consists in the introduction of coils of gold or silver wire into the sac through a hollow needle, combined with the passage of a strong galvanic current, the anode being connected with the wire. There can be no doubt that a firm coagulum forms about the wire, and in favorable cases pulsation of the tumor lessens or ceases. Four successful cases have been recorded in America, and with the improved technique suggested by Stewart, a greater degree of success may be looked for in the future. A full account of the technique will be found in Stewart's papers in the *American Journal of Medical Science*, 1892 and 1896.

Although the special treatment of thoracic aneurism in the majority of cases consists of prolonged rest and the administration of iodide of potassium, as above detailed, there are besides these certain therapeutic measures at our command for the relief of individual symptoms.

Excited cardiac action and palpitation are best relieved by the judicious use of tincture of digitalis and the employment of a bladder of ice over the front of the chest.

The pain, it has been already stated, is generally best treated by the iodide of potassium. If, however, it be very severe, it may be necessary to use hypodermic injections of morphine until the iodide shall have had time to act. Moreover, we do meet with rare cases in which the effect of the iodide ultimately becomes lost, and our only resort is the frequent use of morphine to make life bearable. One very marked case of this kind came under my

notice in the person of a hospital patient. His aneurism was as large as a cricket ball, and almost as solid. Neuralgic pains were complained of persistently, were relieved for a considerable time by the iodide treatment, but, for more than a year previous to his death, we were obliged to administer daily hypodermics of morphine in considerable quantity. Pain of well-defined neuralgic character (especially along the intercostal nerve) is decidedly benefited by the application of small blisters over the most tender parts.

Dyspnoea, if due to accompanying catarrh, must be treated with reference to the latter disorder. But if, as is most frequently the case, it is the result of mechanical pressure and irritation of nerves, recourse must be had to sedatives and narcotics, especially morphine and hydrocyanic acid. Alcohol in tolerably full doses is also of considerable assistance.

If a projecting tumor form, care must be taken to protect it from injury or friction by some arrangement of pads or a shield of some smooth metallic substance lined with cloth.

When rupture has actually taken place, we can probably do nothing; but, if any preliminary bleeding should occur, we may endeavor to prevent this going on to rapid hemorrhage by the use of ice externally and the administration of astringents with ergot, while the most perfect quietude is enjoined. *George Ross.*

RECENT LITERATURE.

Hershey: *Therapeutic Gazette*, September 15, 1896. (Introduction of gold wire into an aneurism of the innominate artery; application of galvanic current for a period of one hour and twenty minutes; partial solidification of contents of aneurism; patient remained well for nine and a half months after the operation.)

Stewart: *British Medical Journal*, August 14, 1897. (Report of post-mortem conditions found in a very large innominate aneurism after the introduction of a coil of gold wire.)

Langton: "Treatment," May 25, 1899. (Report of a case of aneurism of the abdominal aorta cured by the introduction of silver wire into the sac.)

Lancereaux et Paulesco: *Gazette des hôpitaux*, No. 71, 1897. (Injections, at intervals of from two to five days, of a solution of gelatin into the subcutaneous tissues, in a case of aortic aneurism; diminution in size and increased firmness of the aneurismal tumor; disappearance of the pain.)

Lancereaux: *Journal des praticiens*, November 19, 1898. (Further details in regard to the technique which he employs in the treatment of aneurism by the subcutaneous injection of solutions of gelatin.)

Stoicesco: *Journal de médecine interne*, July 21, 1899. (Reports of six cases of aneurism of the aorta and innominate artery treated by the gelatin method.)

ANGELICA.—*Angelica* L. (fam. *Umbellifera*) is a genus the limits and dimensions of which are greatly in dispute among botanists, the various sub-genera of one author being regarded as so many distinct genera by another. As recognized by Messrs. Engler and Prantl, whom we follow, it contains about twenty-five species, most of them natives of the cool temperate regions of the northern hemisphere. The plants abound in the aromatic principles of the family. A number of them have been employed in domestic practice, and two, under the names "European" and "American" angelica, have been very extensively used in medicine.

European Angelica is the rhizome and roots of *Angelica archangelica* L., a biennial, four to six feet high, with a stout, hollow, purple-green, fluted stem, large compound leaves with clasping petioles, and large umbels of white flowers. It is a native of far Northern Europe and Asia, and is very extensively cultivated, our commercial supplies coming mostly from cultivated plants of Germany and France.

It is one of the few vegetables whose use began in the extreme north of Europe and extended southward. It